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The Official
Journal of the
North Carolina
Medical Society

January/
February 1998
Volume 59
Number 1

North Carolina Medical Journal

For Doctors and Their Patients

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FOR DOCTORS AND THEIR PATIENTS

January/February 1998, Volume 59, Number 1

Cover: This photo was part of the Raleigh *News & Observer's* five-part series on NC's hog industry published February 19-26, 1995. The series won the 1996 Pulitzer Prize for public service journalism. Photo by Robert Willett/©*News & Observer.*

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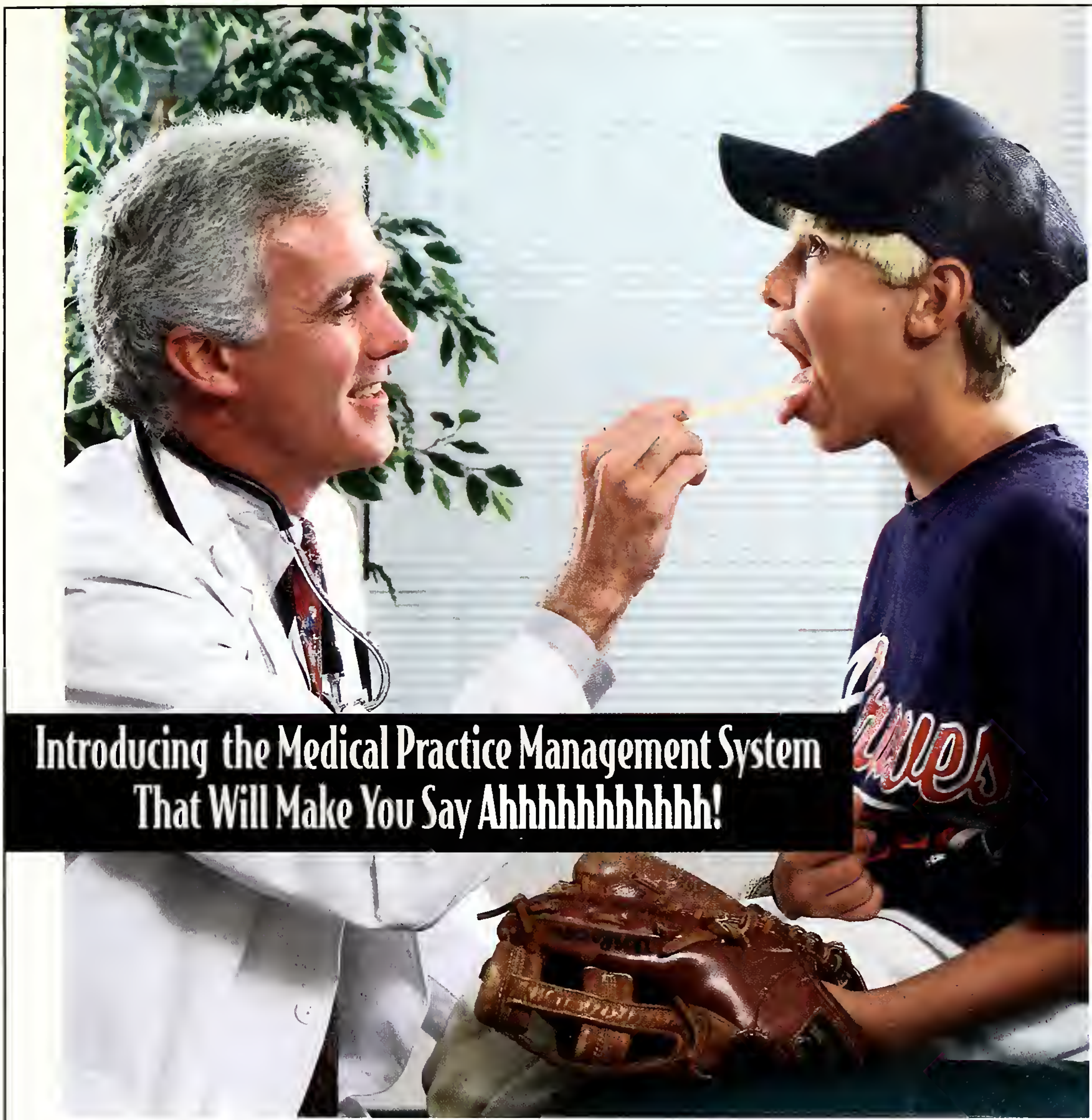

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Letters to the Editor

Tort Reform Would Improve Doctor-Lawyer Relationships

Editor's note: In the September/October *Journal*, attorney Anne Duvoisin urged readers to help revise the medicolegal guidelines (NC Med J 1997;58:372). Dr. William Pritchard, a neurological surgeon in Fayetteville, wrote Ms. Duvoisin with his perspective, which we publish here with permission. A response from two Medico-Legal Committee members follows.

To the Editor:

The most pressing issue in North Carolina regarding the juxtaposition of physicians and attorneys is the terrible environment in which doctors are practicing medicine. Misguided juries, prompted by a handful of renegade trial lawyers, have virtually destroyed the lives and careers of several individual physicians in recent months. The environment for the practice of medicine has never been more hostile than it is right now. The situation that exists in our state significantly affects our health care system. It discourages physicians from coming to practice here and drives older physicians to retire earlier than planned. The doctor/patient relationship is also at risk because each new patient that enters a practice represents a threat to the physician. The most important joint project the North Carolina Medical Society and the North Carolina Bar Association could undertake would be meaningful tort reform as has occurred in California, Illinois, and Virginia.

The complaints of doctors and lawyers Ms. Duvoisin refers to in her article are trivial when compared to malpractice litigation. I have little concern about the guidelines as they are written. Problems should not exist if attorneys and physicians interact in a professional and polite manner. However, physicians today are wary and uncomfortable during depositions or in trial settings when they are required to work face-to-face with attorneys who someday might return as messengers of terror.

Societal mind-set has been molded by an emphasis on litigation as a means of settling disputes and furthering financial gain. Such settings involve workers' compensation, automobile liability and general liability—all seemingly less nocuous matters than medical malpractice but nurturing the same milieu.

The NC Bar Association should work with the NC Medical Society to change the environment that has disrupted the practice of medicine and threatened the health care of our citizens. Failure of the NC Bar Association to do so can only be interpreted as condoning the practices of the small number of individual attorneys who are responsible for, and benefit personally beyond obscenity from the current state of affairs.

William L. Pritchard, MD
101 Robeson St., Suite 300
Fayetteville, NC 28301

Response:

Dr. William Pritchard's letter evoked much discussion by the members of the joint Medico-Legal Committee of Durham County. We present here the essence of those discussions.

We all share Dr. Pritchard's concerns with our system. It is a fact that the provision of insurance, legal services, health care—even the recovery of damages when one is injured—are all for-profit businesses. At times this is unpleasant for health care providers as well as for attorneys, insurers, and patients. No one yet has found a replacement for these businesses.

Dr. Pritchard focuses almost exclusively on issues of medical malpractice. However, malpractice cases represent a minority of the instances in which patients need medical evidence. Civil cases (workers' compensation or personal injury matters) are more common reasons for needing physician testimony about patients.

The medicolegal guidelines aim to ease the burden on all parties involved in personal injury matters by bringing a measure of civility to a process in which the physician plays a vital role. The guidelines establish standards by which attorneys and physicians can work together in the best interests of patients, and through professional cooperation, minimize the number of frivolous lawsuits. Joint Medico-Legal Committee shares Dr. Pritchard's concerns about frivolous lawsuits, and independently of the guidelines, screens complaints from physicians and attorneys to defuse disagreements that might otherwise develop into lawsuits.

Like Dr. Pritchard, most of us question whether a jury trial is the best way to resolve the conflict and disputes that may surround a complex medical case. Dr. Pritchard points out that tort reform has been attempted (but often failed) in other states. One promising alternative to costly litigation is alternative dispute resolution through mediation and arbitration.

The Committee commends Dr. Pritchard for focusing our attention on this timely subject, and for pointing out societal factors that create a hostile environment for the practice of medicine. His Utopian comment that "Problems should not exist if attorneys and physicians interact in a professional and polite manner" has much truth to it. Would that it were so!

Patrick D. Kenan, MD
Immediate Past Chair, Durham Medico-Legal Committee
Member, *Journal* Editorial Board
William H. Breeze, Jr., JD
Chair, Durham Medico-Legal Committee
Attorney, North Carolina Medical Board, Raleigh

The NC Medical Board has neither been asked nor has it taken any position on these issues. The opinions are solely the authors'.

Reader Feedback

To the Editor:

I am a 77-year-old retired dentist. On a recent visit with my wife to her gastroenterologist in Wilmington, I sat in the reception area and started reading your fine publication, the *North Carolina Medical Journal.* I was surprised to read Letters to the Editor concerning the special issue on gay and lesbian health (March/April 1997) and the article "A Fine Day for the Dentist's Chair: Pulling With Mozart" (NC Med J 1997;200).

Could you please send me the back issues or articles on these subjects?

Numa C. Johnson, DDS
115 Widgeon Circle
Hampstead, NC 28443-2432

From the Editor:

We have sent Dr. Johnson the two issues of interest (March/April and May/June 1997). We hope he finds them as stimulating as the letters we published about them. Feedback about our publication is always welcome, and we encourage readers to write or e-mail us about anything we've published.

Pediatrician Speaks From Experience With Oncologists

To the Editor:

As I read Alan Shapiro's essay, "The Compromise of Compassionate Care," in the September/October *Journal* (NC Med J 1997;58:332-9), I was struck by the differences between his description of his sister's oncologist and the oncologists with whom I have had the pleasure to work with over the years. I have dealt with a number of oncologists in my career—adult and pediatric, professionally and personally—through my mother's eventual death from breast cancer and while I was under the care of an oncologist for a condition that, thankfully, did not turn out to be malignant.

I have always found the oncologists I have dealt with to be among the best of us physicians at dealing with chronic illness and end-of-life issues. These physicians have had wonderful relationships with their patients' families, and in my experience, were very supportive even at the time of some of their patients' deaths. We should not be too hasty to criticize the unnamed Dr. P in the essay without hearing his side of the story.

I certainly do not question Professor Shapiro's literary integrity, yet I think that our perceptions of events can be very different when we are under extreme stress, as I am sure Mr. Shapiro was during his sister's terminal illness. Another observer, or the same person under separate emotional circumstances, might perceive the same situation, words, and actions differently.

I am concerned that the many commentators on this essay may rush to judge Dr. P harshly, perhaps without knowing all the circumstances. I recall an incident that occurred while I was a pediatric resident. We had just admitted a very ill infant with *E. coli* meningitis. The family wove a poignant tale, that nearly brought several of us residents to tears, about how they had tried to seek care from their local physician but were refused because of their inability to pay. When one of us called this physician to report on the child's status he said, "Thank God that child finally went to see somebody. We have been trying repeatedly to get this family to come back to our office." He recounted how many times his staff had called the family trying to get them to return. Although this case is not directly analogous to Professor Shapiro's sister's, I hope I never forget the lesson I learned that day: not to judge anyone's actions prematurely.

I would not stand up for someone just because he or she is a physician. We physicians exhibit a variety of personalities, as well as a variety of skill levels of skills and comfort with end-of-life issues. The episodes described in the essay may have happened exactly as they were written and interpreted. I hope and believe though, that as a whole, we do much better than this in most cases.

Ronald J. Pudlo, MD, FAAP
Greensboro Pediatricians, Inc.
510 N. Elam Ave., Suite 202
Greensboro, NC 27403

Getting the Word Out About Domestic Violence Prevention

To the Editor:

During several national meetings I recently attended, I distributed copies of the September/October *Journal,* which featured a section on domestic violence (NC Med J 58:308-28), for which I served as guest editor. *Journal* readers might be interested to know who is reading this section:

Nancy Dickey, MD, AMA president-elect;
Carol Warshaw, MD, consultant, Family Violence Prevention Fund, and chair, AMA committee that wrote the AMA Guidelines on Domestic Violence;
Anne Flitcraft, MD, director, Connecticut Domestic Violence Training Project, and domestic violence consultant to the CDC, Congress, and Surgeon General;
Ellen Taliaferro, MD, president-elect of American Association of Women Emergency Physicians, and cofounder of Physicians for a Violence Free Society;
Marjorie Braude, MD, member, National Advisory Committee, Family Violence Prevention Fund, and chair, American Medical Women's Association's Domestic Violence Task Force;
Barb Poremba, Polaroid Corporation;
Debbie Lee, associate director for health, Family Violence Prevention Fund;
The Hon. Nancy Jenkins, mayor of Greenville, NC; and
Francess Page, RN, senior public health advisor to Health and Human Services Secretary Donna Shalala.

This exposure should help increase others' awareness of the excellent work we are doing in North Carolina to address the problem of domestic violence, and hopefully, will lead to greater professional collaboration. I had hoped to give additional *Journals* to others, but ran out of copies. I plan to get more, and distribute them as opportunities arise. Congratulations to all for a job well done!

Peggy E. Goodman, MD, FACEP
Assistant Professor
ECU Department of Emergency Medicine
Chair, NCMS Domestic Violence Committee
Greenville, NC 27858

Keeping a Noble Profession Professional

To the Editor:

Dr. William Blythe's address to the AOA chapter at the UNC School of Medicine published in the November/December issue was superb ("Some Thought on Keeping Our Noble Profession Professional and Noble," NC Med J 1997;58:424-6). Students are fortunate to have a mentor with such perception, and our profession will benefit from such candid introspection.

The problems facing health care delivery are substantial. But if we maintain a sharp focus on fundamental issues in the way Dr. Blythe has described, there can be no doubt that patients, along with their physicians, will assure that our profession will remain "professional and noble."

Thad B. Wester, MD
Past President, North Carolina Medical Society
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Bald Head Island, NC 28461
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Issues to Consider When Dealing with Premature Death

To the Editor:

Long before Abraham, Moses, Jesus, or Mohammed, Zoroaster (Zarathustra), in a stunning essay in his celestial book *Avesta*, spoke of the epistemological dualism of good and evil. As the original theist and the person credited with coining the word God, Zoroaster spoke of Ahura Mazda, God of light and good, and Ahriman, God of evil. He proposed that these two Gods are in constant battle in the world around us and in the world within us (the latter is thought to be the original literary contribution to psychoanalytic understanding and the architecture of intrapsychic phenomena). Zoroaster concluded that Ahura Mazda needs our help to ensure dominance of good and love. He does not mention the triumph or conquest of Ahriman, of evil. The two coexist. It would be reasonable to acknowledge that death, even the death of a child, is not evil. Death is an integral part of life. As caregivers, we must understand and internalize this essential premise.

In dealing with death and dying, especially the premature death of a child as in the article "Children Are Not Supposed to Die" (NC Med J 1997;58:445-8), I believe that caregivers must be aware of four basic issues. They must come to terms with these issues, fully understand them, and be at peace with them before contacting and working with the families.

1) Most caregivers, especially physicians, are vulnerable to arrogance and delusion of omnipotence. We must be aware that the mask of omnipotence only covers our deep sense of insecurity and inadequacy. Death at any stage of life is a reality. It does not and should not reflect anyone's failure. If life's inexorable limitations are accepted with humility, death does not and should not pose a blow to one's ego.

2) We need to be aware of our own limitations and harness our own unrealistic expectations. Families of dying patients often have unrealistically high expectations of medicine. Caregivers must acknowledge this and avoid participating in and fostering families' heightened expectations, which may approach delusional proportions.

3) We are all victims of mass media hysteria. A century ago in private salons of Charcot's Salpêtriére Clinic, women acted out their hysteria through ritualistic dances and hoped to obtain cure by hypnosis. Those rituals are now subserved by television and talk shows. Hyperbolic and highly exaggerated claims are the norm. Promises—of high-tech miracles, of ever exciting new drugs, of the discovery of new genes—elevate people's expectations to unrealistic levels. Physicians must guard against this unwelcome phenomenon and work with the families to bring them back to the real world.

4) As caregivers, we should not hide ignorance behind the trappings of white coats, diplomas, chains of letters after our names, or the intimidation of hospital and office settings. We should admit how much we do not know and do not understand. Yet, in our admitted ignorance, with humility, continue to love, to care, and to empathize.

Assad Meymandi, MD, FAPA
Member, *Journal* Editorial Board
3320 Executive Drive, Suite 218
Raleigh, NC 27609

Signing Up for Manuscript Peer Review

To the Editor:

I very much enjoyed the November/December *Journal*. In it, I read that you encourage readers to become manuscript reviewers, and I offer my services as such. I am a fellow in Reproductive Endocrinology in San Antonio, and I am considering returning to North Carolina next summer. I am an NCMS member and have maintained my licensure in North Carolina, so I remain interested in medical activities in the state. Let me know if I can help, and keep up the good work on the *Journal*.

Gerard M. Honoré, PhD, MD
UT Health Science Center at San Antonio
Department of Ob/Gyn
7703 Floyd Curl Drive
San Antonio, TX 78284

From the Editor:

We rely greatly on the many physicians who evaluate manuscripts for us; they provide a service that cements our status as a peer-reviewed publication. We welcome Dr. Honoré's offer to help and we encourage other readers to write, call, or e-mail us to inquire about critiquing submissions.

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Conjoint Report

To the North Carolina Medical Society and the North Carolina Commission for Health Services

Ronald H. Levine, MD, MPH

Editor's note: *This report is an adaptation of State Health Director Levine's address at the NCMS Annual Meeting at Pinehurst, November 14, 1997.*

I am pleased to have the opportunity once again to acquaint the health care community of North Carolina with several issues of public health importance in our state. I hope that my report will not only serve as an update but will spur collective action, where appropriate, to alleviate preventable health problems faced by North Carolinians and promote the higher level of health status to which we all aspire.

Infant Mortality

Without question, mutual commitment has been at the heart of a number of initiatives designed to reduce North Carolina's unacceptably high rate of infant morbidity and mortality. The foundation of our "Back to Sleep" campaign has been the practicing physicians who counsel mothers to put healthy infants on their backs or sides to sleep; I am pleased to report that this initiative has been associated with a 30% decrease in infant deaths due to sudden infant death syndrome. Cooperative, science-based activities of this nature have significantly helped lower the infant mortality rate in North Carolina from 12.6 per 1000 live births in 1988 to 9.2 in 1996, a decline of 27%.

A most unsettling and perplexing finding, however, has become apparent during this same period: The percentage of liveborn infants of low birth weight (less than 2500 grams) actually increased from 8.0% to 8.7%. Thus, the recent large decline in infant mortality has been the result of better survival of low birth weight and normal birth weight babies, but not the prevention of premature births.

The causes of low birth weight are multiple, and we clearly need more than medical intervention to reduce this problem. In 1995, North Carolina women delivered almost 9000 low birth weight babies. More than three quarters of these mothers began prenatal care in the first trimester and that's good. But it is clear that getting more women to participate in prenatal care (which we must, of course, continually strive for) will not provide "the answer" to the problem of low birth weight. In fact, the percentage of mothers beginning prenatal care in the first trimester increased from 75% in 1988 to 83% in 1995.

Now this next statistic may surprise you as it did me: 80% of low birth weight babies were born to mothers aged 20 or older. Thus, teenage pregnancy makes a relatively small contribution to low birth weight in North Carolina. Clearly, health interventions, while immensely important, are only part of the solution to the serious and intransigent problem of low birth weight babies. Nevertheless, much of our current data and understanding defies conventional wisdom and points to the need for additional research on the factors disposing to low birth weight.

Immunizing Children

The North Carolina immunization registry now operates in all 100 county health departments. Our next step is to extend the registry to embrace all privately practicing physicians who immunize children. Once the registry is fully implemented, public and private health care providers can work together to ensure that every child is properly immunized and fully protected from vaccine-preventable diseases. The registry is a tremendous tool that will: 1) generate immunization reminders (proven to be extremely successful in raising coverage levels); 2) provide electronic access to the immunization histories of young patients, even if previous shots were administered elsewhere; and 3) provide parents with up-to-date records for their child's school entry, summer camp admission, or athletic participation. The North Carolina immunization registry will help us bring about a new era in public-private cooperation on behalf of better health for our kids.

Better Teeth

"Seal the State in '98" is an effort that will bring together volunteer dentists, other dental care providers, and community volunteers to provide free dental sealants for children in all 100 counties across the state. Dental sealants are significantly underused in North Carolina. Only one quarter of our children have had sealants placed on their permanent teeth despite the fact that the pits and fissures of the chewing surfaces of teeth are most susceptible to decay. Studies have demonstrated that sealing these surfaces can reduce caries by an estimated 80%. We have great hopes for "Seal the State in '98."

Compensating Medical Examiners

I must warn you that we are presently experiencing a serious threat to the integrity of North Carolina's outstanding medical examiner system. The 1997 session of our General Assembly failed to enact a requested upward adjustment in the fee for a medicolegal autopsy. This fee has not been raised in 11 years, and the lack of appropriate compensation puts us at risk of losing the private pathologists who are contracted to perform these exams. The current fee does not begin to cover costs. It is essential that we address this problem during the next year so that we can maintain the high quality of our postmortem medicolegal investigations. I hope and trust that the Medical Society will give this matter serious attention.

> "(The fee for medicolegal autopsies) has not been raised in 11 years, and the lack of appropriate compensation puts us at risk of losing the private pathologists who are contracted to perform these exams."

"BANC-ing" on the Future

As has been my custom in past reports, I want to highlight this year an issue that I believe to be extremely important; one that cries out for collaboration, not just for members of the health community but for those in commerce, in industry, in education, indeed throughout our entire society. The first-ever Surgeon General's report on physical activity and health, released in July 1996, found that well over half of all Americans are not regularly physically active; indeed 25% of Americans are not active at all. Among young people—the future of our country—physical activity declines dramatically during adolescence. Let's bring the data closer to home: 82% of North Carolina adults get less than 20 minutes of exercise as often as three days per week. This places us 49th in the nation in physical activity by adults. The only reason we are not 50th is because Rhode Island did not submit its data! We recently learned from a University of North Carolina study that the primary leisure time activity of nine-year-old North Carolina boys is playing video games. Is it any wonder that 26% of our third and fourth graders are overweight? Our pediatricians tell us that hypercholesterolemia and hypertension are showing up in an ever-increasing percentage of Tarheel children.

> "The lack of fitness of our citizens, particularly our children, represents an insidious epidemic that will inevitably lead to increased cardiovascular disease and horrendous expenditures for otherwise preventable disability and suffering."

By the year 2000, physical inactivity will cost our state $180 million because of circulatory disease alone. Heart disease and stroke each year claim more lives than cancer, auto accidents, AIDS, domestic violence, and alcohol abuse combined—40% of all deaths in North Carolina! But in North Carolina only 40% of schools have a certified physical education teacher and our schools are, if anything, reducing physical education curriculum time.

The lack of fitness of our citizens, particularly our children, represents an insidious epidemic that will inevitably lead to increased cardiovascular disease and horrendous expenditures for otherwise preventable disability and suffering. We must not sit back and simply accept as inevitable a sociological phenomenon that portends such dire outcomes for the public's health.

This Society recently adopted the recommendation of its Executive Council to join a three-year, comprehensive multi-level initiative to increase physical activity in North Carolina. "Be Active North Carolina," or BANC, kicks off in 1998 with programs designed to achieve lasting behavioral changes in the area of physical activity. BANC will focus at first on youth, employees at their worksite, and older adults. Practicing physicians will be key partners, along with members of many private and public organizations and hosts of trained volunteers. Failure is not an option! We have teamed up successfully to address so many other daunting challenges in the past. We can pull this off too, and in so doing, save precious resources, precious futures, and precious lives.

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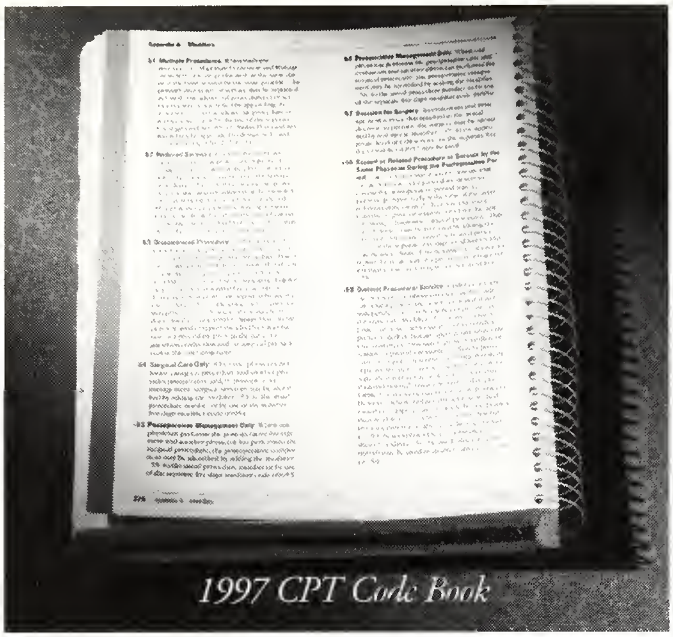

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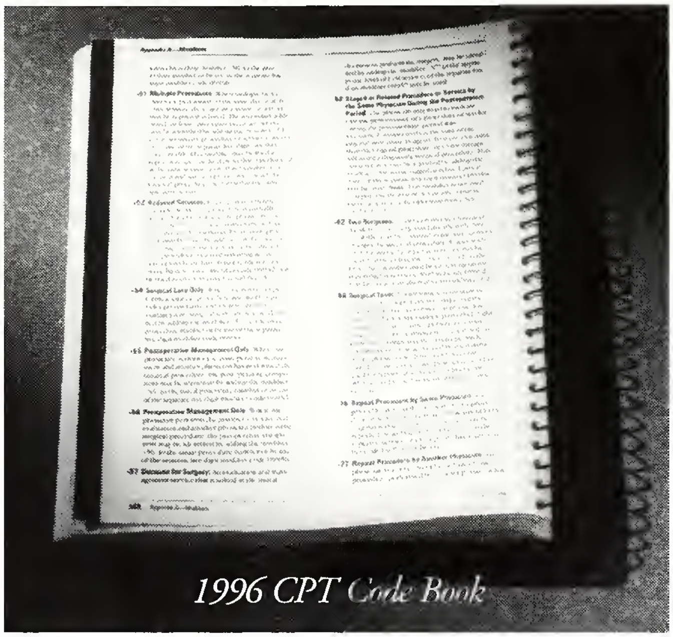

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Of Hogs and Men

Does North Carolina's Hog Industry Raise the Risks of Infectious Disease?

Vance G. Fowler, Jr., MD, Stavra Xanthakos, MD, and G. Ralph Corey, MD

Agriculture, the leading industry in North Carolina, provides 28% of the state's income and employs 21% of its workforce.[1] A large portion of the state's agricultural revenue derives from the hog industry, which has become a vital part of North Carolina's economy. In 1995, the value of hog sales exceeded $1.2 billion and represented 18% of the state's total cash receipts from farming.[2] North Carolina's hog industry has grown dramatically. Between 1983 and 1997, the state hog inventory increased by 433% from two million to more than nine million hogs. Today North Carolina's hog population is the second largest in the United States.[2] This rapid growth (emphasized by occasional hog waste spills) has heightened public concern about the potential health risks posed by the swine industry.

During the past decade in North Carolina, large swine operations have largely replaced traditional methods of production (see related article on page 16). For example, from 1983 to 1997, as the state's swine population was quadrupling, the number of hog farms was decreasing to one-fourth of the original number (from 23,500 to 6000).[2] Wastes from large swine operations are routed into a lagoon. Spillage of nutrient-rich lagoon contents can cause fish kills but also raises concern about contamination of drinking water supplies. It is not yet clear what impact new farming techniques will have on hog-associated human illness. Several hog-associated infections (toxoplasmosis, trichinosis) are less common in pigs raised in total confinement,[3] but other human pathogens such as salmonella are still common in swine raised in modern facilities. In this paper we review currently available information on hog-related infections in North Carolina (Table 1, next page).

Hog-Associated Infectious Diseases

Salmonellosis Various species of salmonella are important causes of foodborne gastroenteritis, enteric fevers, and focal or systemic human infection in the US. The intestinal tract of hogs is an important reservoir of salmonella; a recent study of over 2200 swine in North Carolina found that 25% harbored *Salmonella* species in their feces.[4] Several of the species most frequently identified in this study (*S. typhimurium*, *S. heidelberg*, *S. agona*) can infect humans.[5] The investigators found that modern methods of pig farming did not appear to reduce the prevalence of salmonella compared to conventional systems. However, new methods of hog raising may have unexpected adverse effects on environmental contamination.

Fortunately, in North Carolina all human infections with salmonella must be reported to the Epidemiology Division of the North Carolina Department of Environment Health and Natural Resources, which means the yearly incidence of human salmonellosis can be determined. The annual incidence has remained constant during the recent expansion of the hog industry. From 1989 to 1995, the hog population increased from 2.7 million to 7 million,[2] but the annual incidence of reported salmonella infections remained unchanged at a mean of 1173 cases annually (range: 957-1265).[6] Furthermore, since 1989 the 11 leading hog-producing counties have contributed only 10%-12% of the annual total of reported salmonella cases; most cases occur in the populous urban counties.[6] However, while there is currently no evidence to suggest that the hog industry has increased the statewide incidence of human salmonellosis, neither have modern methods of raising hogs decreased the high prevalence of hog colonization with salmonella. The risk of human infection therefore remains a concern, and future efforts to ensure the safety of pork should be directed toward controlling enteric organisms such as salmonella.[4]

Brucellosis Throughout the world, *Brucella* species cause

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Table 1. Hog-associated human infections in North Carolina

	Occurence in humans[6]	Occurence in hogs
Salmonella	1100 cases/year	25% prevalence[4]
Brucella	77 cases/20 years	eliminated in NC hogs[7]
Trichinosis	6 cases/20 years	virtually eliminated[11]
Toxoplasmosis	unknown	virtually eliminated[11]
Leptospirosis	17 cases/20 years	173 cases in 1996[15]
Erysipelothrix	unknown (probably rare)	31 cases since 1994[15]
Streptococcus suis	unknown (probably rare)	325 cases since 1994[15]
Yersinia enterocolitica	unknown	unknown

serious systemic illnesses characterized by fever, constitutional complaints, lymphadenopathy, and splenomegaly. Definitive diagnosis requires documentation of infection, either by blood or bone marrow culture, or serological testing. In the US, human brucellosis is rare and primarily affects livestock and abattoir workers. Infection occurs through contamination of broken skin or by inhalation. Because hogs are a reservoir for *Brucella suis*, there is a national program to eradicate swine brucellosis. This program locates and eliminates infected swine; as of December 31, 1993, swine herds in all but seven states (Texas, South Carolina, Florida, Georgia, Tennessee, Hawaii, Oklahoma) were considered brucellosis-free.[7]

North Carolina's swine herd is considered brucellosis-free, but there have been 77 confirmed human cases of brucellosis in North Carolina since 1977.[6] From 1977 until 1992 and from 1994 until the present, 1-3 cases of human brucellosis were reported each year in North Carolina,[6] and most of these cases probably arose from ingestion of unpasteurized foreign dairy products. In 1992 and 1993, however, 45 cases of human brucellosis were reported, most of them in kill floor workers at a single eastern North Carolina pork processing plant.[7] Every day the plant processed approximately 8000 pigs from 10 states, including several in which swine brucellosis is still endemic.[7] Because screening has identified no brucella in North Carolina swine for several years, it is presumed that the infected swine originated in a brucella-endemic state.[8] However, the National Institute for Occupational and Safety and Health still recommends preventive measures such as the use of protective equipment (rubber gloves, face shields), maintaining the kill floor at negative atmospheric pressure, and processing only brucellosis-free swine. The possibility of brucellosis should be entertained in any pork processing plant employee who has fever, splenomegaly, or lymphadenopathy. Statewide surveillance for this potentially fatal illness should be maintained.

Trichinosis Human exposure to the tissue-dwelling nematode, *Trichinella spiralis*, causes fever, myositis, periorbital edema, and eosinophilia. Swine have long been known to be the major source of human infection with *T. spiralis*, and pork-associated outbreaks continue to be reported.[9] At the turn of the century, 1.41% of the US hog population was infected, but the prevalence declined to 0.125% by the 1970s,[10] largely because of restrictions on the feeding of uncooked garbage to pigs and improved farm management.[3] Modern hog management practices in North Carolina have virtually eliminated the risk of swine infection with *Trichinella*. For example, more than 2200 North Carolina hogs raised in either traditional or modern production systems were recently tested for antibodies to *T. spiralis*; only one hog (0.04%) was positive (Davies R, et al, unpublished data, 1997) and this animal had been raised in a traditional dirt lot. As a result of this drastic reduction in infected hogs, only two cases of human trichinosis have been reported in North Carolina since 1987.[6]

Toxoplasmosis Infection by the intracellular protozoan *Toxoplasma gondii* can cause congenital fetal malformations in pregnant women and ocular and intracerebral lesions in immunocompromised persons. Toxoplasma oocysts are most commonly transmitted to humans via ingestion of undercooked meat or from food or hands contaminated by cat feces; fetuses are infected via transplacental spread. Swine are a major source of human infection for *T. gondii*.

In the early 1980s, 24% of a random nationwide sample of swine were seropositive for *T. gondii.*[11] Since then several studies have shown that pigs raised in modern facilities using total confinement have a lower prevalence of toxoplasma infection.[12,13] Indeed, modern hog management practices in North Carolina appear to have virtually eliminated swine infection by *T. gondii*. Only 13 (0.56%) of more than 2300 North Carolina hogs recently tested were positive for antibodies to *T. gondii* (Davies R, et al, unpublished data, 1997), and 12 of them (92%) had been raised by traditional pasture methods. Only one (0.05%) of the 1826 hogs kept in modern total confinement facilities was positive. Unfortunately, the extent of human infection with *Toxoplasma* is unknown since most human disease represents the recrudescence of latent infection in immunocompromised persons such as those infected with human immunodeficiency virus.

Leptospirosis Human infections by any of several members of the genus *Leptospira* occur by contact with urine or tissue from an infected animal, or water or soil contaminated with the organism. Infection is characterized by fever, conjunctival infusion, hepatitis, and renal failure. Aseptic meningitis may also occur. Leptospira infect many species of animals, including swine. A carrier state with urinary shedding of leptospira may persist for months. In 1996, 173 cases of swine leptospirosis were diagnosed by testing of sera submitted to the North Carolina Animal Disease Diagnostic Laboratory System.[14] Despite this, human leptospirosis is rare; only 17 cases of human leptospirosis have been reported in North Carolina since 1977.[6] Furthermore, the annual incidence (0-3 cases) of human leptospira infections reported to the state has remained unchanged during the recent hog industry expansion. There is no evidence to suggest that hog industry growth has increased the statewide incidence of human leptospirosis.

Other diseases Several other infections are associated with swine, but it is not known whether the growth of the hog industry in North Carolina has affected their prevalence because they are uncommon or not reportable (or both). One pathogen, *Erysipelothrix rhusiopathiae*, is a gram-positive bacillus that causes cutaneous or disseminated infection in humans. Humans usually acquire the organism via cutaneous inoculation from infected animals or water. Erysipelothrix is frequently isolated from swine, where it may or may not cause disease.[15] Since 1994, 31 hog carcasses submitted to the North Carolina Animal Disease Diagnostic Laboratory System have had confirmed *E. rhusiopathiae* infection.[14] Unfortunately, the number of human cases is unknown.

> "All available data suggest that the risk of infectious diseases posed by the state hog industry, while potentially important, is limited primarily to pork production employees who may come into contact with brucella, *Erysipelothrix*, or *S. suis*."

A second organism, *Streptococcus suis*, causes sepsis in hogs and, rarely, disseminated infection in humans.[16,17] Farmers, butchers, and abattoir workers can be infected through contamination of skin wounds that come in contact with hogs or raw pork. Since 1994, 325 hog carcasses submitted to the North Carolina Animal Disease Diagnostic Laboratory System have had confirmed *Streptococcus suis* infection.[14]

A third organism, *Yersinia enterocolitica*, is an uncommon cause of fever, diarrhea, and abdominal pain that may mimic appendicitis. Sepsis occurs rarely but particularly in patients with hemochromatosis.[18] Swine appear to be a major reservoir[19] (in one northern European study, *Y. enterocolitica* was isolated from 42% of 86 pigs tested[20]). Farmers, butchers, and abattoir workers become infected through contamination of skin wounds by contact with hogs or raw pork.[21] Ingesting raw pork can lead to infection, and several recent cases involved consumption of poorly cooked chitterlings.[22,23] The importance of *Y. enterocolitica* as a cause of infection in humans and swine in North Carolina is unknown.

Conclusion

All available data suggest that the risk of infectious diseases posed by the state hog industry, while potentially important, is limited primarily to pork production employees who may come into contact with brucella, *Erysipelothrix*, or *S. suis*. The recent development of corporate hog farming in North Carolina has greatly increased the confined swine herd. This has actually reduced the risk of hog (and presumably human) infection by *T. gondii* and *T. spiralis*.

Modern production practices do not appear to reduce the prevalence among hogs of enteric organisms such as salmonella. The presence of that reservoir of infection and the fact that modern hog practices lead to large pools of contaminated water and soil have raised concern about the safety of neighboring water supplies. Available epidemiological data do not suggest any increase in the incidence of diseases caused by waterborne human pathogens such as salmonella or leptospira. To maintain this excellent track record, we need to continue active surveillance of soil and water in drainage areas surrounding large hog facilities. In addition, we need to follow closely the statewide epidemiology of potentially hog-associated infections. Finally, the state should add infections by *Y. enterocolitica* and *E. rhusiopathiae* to the list of reportable conditions. ❑

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Human Health Effects of Hog Waste

Marian Swinker, MD, MPH

A recent telephone survey indicated that residents of eastern North Carolina put clean water and the growth of the hog industry at the top of their list of concerns about quality of life. These issues are linked because the food animal industry produces huge amounts of waste products (manure, litter, dead animals, and processing plant offal) that can contaminate water. In 1995, there were an estimated 7.6 million hogs in North Carolina, 80% raised as part of intensive livestock operations[1] (ILO), which concentrate by-products in a small area, intensifying the environmental impact. The net effect is that each animal generates a volume of waste water equal to that of a human resident.[2]

The typical swine ILO maintains the hogs in an enclosed building with a concrete floor. The floor is hosed down regularly to wash accumulated waste into a shallow lagoon where solids settle and anaerobic digestion occurs, removing nutrients and lowering fecal coliform bacterial counts by approximately 90%. The supernatant liquid is disposed of by spraying onto surface land for fertilization and nutrient recycling, and the solids are removed from time to time to prevent the lagoon from filling in. The lagoon fluid is nutrient-dense; if it should spill into a waterway, the organic material is digested by aerobic bacteria, consuming oxygen. This depletion of dissolved oxygen in the receiving waters can asphyxiate fish and other aquatic organisms and degrade water quality through the anaerobic decomposition of organic wastes. Furthermore, nitrogen and phosphorus contained in the lagoon fluid can foster growth of algae and bacteria.

The results of overfertilization of waterways is a condition known as eutrophication. Eutrophication can occur because of nutrient runoff from other sources (inorganic fertilizer sprayed on fields; septic tank drainage; residual nitrogen and phosphorus in municipal sewage plant effluent from which solids and organic residues have been removed). Eutrophication is accelerated by warm temperatures.

The environmental effects of hog waste add to the effects of wastes from other human activities. The effects fall into several categories: microbial, indirect microbial, toxic residues, and gaseous.

Microbial Agents

The intestinal tract of swine can carry a variety of bacteria, viruses, and protozoa potentially pathogenic to humans, including *Salmonella, Toxoplasma, Leptospira, Cryptosporidium, Campylobacter* and *Yersinia*.[3] Livestock serve as a reservoir for *Cryptosporidium*, the cause of recent large outbreaks of diarrhea in Milwaukee and Las Vegas that resulted in several deaths. Pigs are the primary reservoir of *Yersinia*, which can be found in uncooked meat or in food processing effluents. It can cause enteritis or appendicitis, and is primarily spread by contaminated food and water; person-to-person spread is rare. *Campylobacter* is acquired by ingestion of undercooked poultry or pork as well as from contaminated dairy products or inadequately chlorinated water; person-to-person spread is unusual. A study in Italy[4] found 23% of meat specimens and 37% of surface waters contaminated with *Campylobacter*. This organism is a frequent cause of acute infectious diarrhea in the United States and is the infectious agent most often associated with Guillain-Barré syndrome. *Salmonella enteritidis* can cause dysentery after being ingested with food or water contaminated by feces from infected animals or humans. Finally, enterotoxigenic *E. coli*[6] strains have been found in swine and beef manure. The diseased caused by infection with most of these organisms are reportable to the state health department, but it is not known whether the presence of hog farms increase the baseline prevalence of such infections.

The presence of coliform bacteria in drinking water is an indicator of microbiologic quality.[5] Contamination by fecal material from any source will raise coliform counts, but their mere presence in water is nonspecific, since some coliforms can be found in soil. The presence of *E. coli* usually indicates fecal contamination by warmblooded animals, but does not specify the animal or human source.[5] The development of phage typing,

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chemical-fermentation, or drug-resistance tests may someday allow us to distinguish coliforms from animal or human sources, and thereby help design appropriate pollution control efforts.

Most hog processing houses in North Carolina do not accept herds for slaughter if they are known to be infected with *Brucella*. Even so, two outbreaks of brucellosis occurred several years ago at a North Carolina slaughterhouse handling animals without apparent infection.[7] *Brucella* are spread primarily by direct skin contact with animal blood and carcasses, but airborne cases have been reported. *Brucella* can be found in urine and offal of infected animals, but environmental transmission is unusual.

We have less information about viral agents. Hepatitis E, a food- and waterborne virus similar to hepatitis A, is carried by swine. It has caused infection in Asia and South America, but is not currently a concern in the US. Enteroviruses are also carried by swine, including the organism that causes vesicular stomatitis in hogs. When spread to humans by direct contact, it causes illness that is indistinguishable from human Coxsackie virus infection.[3] Enterovirus can spread from hogs to humans who have direct contact with the animals, but there are no data on spread from animals via waste disposal. On the other hand, enteroviruses aerosolized by the agitation tanks in municipal sewage treatment plants can pose a risk to human operators.

Microbial Effects

The indirect microbial effects of hog waste are quite variable. Recent years have seen an increase in human infection with antibiotic-resistant organisms such as vancomycin-resistant enterococci. Some research[8-10] suggests that antibiotic-resistant organisms arise from animal farming, including swine farming. The spread of resistant strains is fostered by use of antibiotics in hospitalized patients who have been colonized with such bacteria. The microbiology of waste water reclamation is quite complex. It involves a myriad of interactions among organisms from the soil and from the waste itself. For example, field tests suggest that mixing swine manure and septic tank effluent accelerates the degradation of *Giardia lamblia* cysts.[11] Swine waste inactivates polio viruses via a bacterial proteolytic enzyme.[12] The process of waste water reclamation in natural or human-made environments involves many synergistic relationships that are not clearly understood.

Toxic Residues

The disposal of waste materials can produce toxic residues. One example is the formation of nitrates from nitrogenous waste. In the human gut, nitrate is reduced to nitrite and absorbed, leading to formation of methemoglobin and a reduced oxygen-carrying capacity. Nitrate-induced methemoglobinemia occurs primarily in infants whose formula is mixed with well or tap water, possibly because fetal hemoglobin is more readily reactive or because the infant's gut flora facilitates conversion of nitrate to nitrite. The consequences are serious. Methemoglobinemia can produce cyanosis, dyspnea, lethargy, coma, and sometimes death. It is treated with oxygen and administration of methylene blue, either orally or intravenously, to regenerate the hemoglobin. This syndrome was first reported in 1945,[13] and led to setting the standard for nitrate concentrations in drinking at 10 mg/L or less. Unfortunately, cases continue to be reported decades later.[14,15] Other deleterious human health effects of nitrates in drinking water have been suggested, including reproductive problems and carcinogenesis,[16,17] generally in locales where water nitrate levels were two to 10 times the standard.

Use of well water is associated with a disproportionate number of waterborne disease. In 1991-1992, 76% outbreaks of waterborne disease in the US were associated with well water use.[18] The number of outbreaks has not changed during the past five years, but new etiologic agents (*E coli* 0157:H7 or *Cryptosporidium*) have been reported. How wells are constructed affects the risk of contamination; wells deeper than 50 feet are less likely to be contaminated.

Because of concern about intensive agricultural operations in North Carolina, the Department of Environmental Health and Natural Resources (DEHNR) offered statewide free well water testing. As reported in 1996, this testing found 47 wells in Sampson County (22% of total sampled) and 89 wells statewide (9.4% of total sampled) to have nitrate concentrations in excess of 10 mg/L.[19] Testing was done at owner request so sampling was not systematic and the results not necessarily representative.

Wells become polluted with nitrates from organic nitrogen in the soil and contamination from synthetic fertilizers, septic tanks, and animal waste. A study commissioned by the North Carolina Pork Council[19] confirmed the elevated nitrate levels found by DEHNR, and the poor construction and shallow depth of contaminated wells. Most wells were contaminated by nitrates from more than one source (the largest number had three potential sources). Poultry litter spread on fields was the most frequent potential source of nitrate, followed by crop fertilizers and septic tanks to an equal degree, and then by hog sources (swine houses, lagoons, and spray fields). When the contributions of each source were quantified by isotope profile analysis, nonanimal sources were the primary contributors of nitrate in all cases. Animal sources were a secondary contributor in six of 22 contaminated wells. This study points out the multifactorial, additive, and interactive nature of ecological problems. The magnitude of each contributing factor (and feasibility of controlling each) must be considered when solutions are sought and the costs of potential benefits assessed.

Another potential health effect of ILO is the introduction of antimicrobial agents into the environment via urine and feces. Antibiotics are often added to the feed of swine, cattle, and poultry raised in ILO. Common antibiotics have been found in waste water specimens but at such low levels (10 parts per billion or 10 ug/L)[20] that it is unknown whether they have any human health or environmental impact.

Eutrophication of waterways from the nutrient enrichment of surface waters can lead to deoxygenation and fish kills, or the overgrowth of organisms such as algae, dinoflagellates (the cause of "red tides"), and *Vibrio vulnificans*. Marine vibrios thrive in warm temperatures and the presence of elevated nutrients in salt or brackish water. *V. vulnificans* can cause systemic infection after ingestion of contaminated shellfish by persons with impaired liver function and can also cause cellulitis after skin exposure to contaminated waters. The resulting purplish or bullous skin lesions respond to treatment with tetracycline or third-generation cephalosporins.

Gaseous Agents

The gaseous by-products of ILOs are a frequent concern. In general, lagoons do not generate toxic levels of gases during routine operation, but if the lagoon is disturbed by mixing or draining, ammonia, methane, hydrogen sulfide, and carbon dioxide can be released. Over the short-term, hydrogen sulfide levels can get high enough to irritate the mucous membranes and respiratory tract, and even lead to central nervous system symptoms including collapse, unconsciousness, or coma.[21] If the slurry is handled in a enclosed space, (such as tanks or manure pits) depletion of atmospheric oxygen can put workers risk of hypoxia or death. Gas mask protection or oxygen supplementation is recommended for such situations.

Of great concern to the public, especially those living near ILOs, is the aesthetic effect of noxious odors. A noticeable smell of ammonia or hydrogen sulfide produced by lagoon waste digestion is common. These volatile agents are sufficiently diluted in air that there is no significant risk of overt toxicity, but they may impact quality of life. A recent study in North Carolina[22] found that persons subjected to odors from nearby intensive swine operations reported more tension, depression, anger, confusion, fatigue, and more total mood disturbances than did control subjects. Both physiologic and learned responses may play a role in producing these effects.

In summary, the waste products of intensive swine raising and processing give rise to a complex array of potential human health effects. The specific magnitude of the contributions from these activities (and any resultant adverse effects) are difficult to distinguish from effects of other human activities. It is important to be aware of the potential effects, but to consider all sources before ascribing a causal relationship. ☐

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The *Journal* will consider for publication articles relating to and illuminating medical science, practice, and history; editorials and opinion pieces; letters; personal accounts; poetry and whimsical musings; and photographs and drawings. Papers that relate to the present, past, or future practice of the health professions in North Carolina are especially pertinent, but manuscripts reflecting other perspectives or topics are welcomed. Prospective authors should feel free to discuss potential articles with the editors.

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Prepare papers according to the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (N Engl J Med 1991;324:424-8) with the following exceptions: 1) no abstract is needed; 2) no running title is needed; and 3) report measurements in metric units; use of the International System of Units (SI) is optional.

Submit a cover letter and a 3 1/2-inch computer disk that contains the text written in MS DOS- or Macintosh-compatible format. *Also enclose three hard copies of the text for review purposes.* Double space text with one-inch margins. *Please do not "format" the text* (e.g. no variations in type size, no bold face, no italics, no embedded endnotes).

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Let's Abolish the Office of Alternative Medicine of the National Institutes of Health

Edward C. Halperin, MD

The Office of Alternative Medicine (OAM) of the National Institutes of Health (NIH) was mandated by Congress in 1991, and launched in 1992 with an annual budget of $2 million. Congress has increased the office's budget steadily, to $12 million this year. Recently Oregon Democrat Peter A. DeFazio introduced a bill, cosponsored by 155 other members of the House of Representatives, to elevate the OAM to the status of major center at the NIH and change its name to the National Center for Integral Medicine. Senator Tom Harkin (D-Iowa) plans to introduce a similar bill in the US Senate.[1]

The OAM is charged with screening and evaluating the clinical benefits, if any, of unconventional or nontraditional approaches to health problems. In return for millions of our tax dollars, the Office has funded studies such as the following:

1) A study of ayurvedic medicine (a traditional medicine of India). Patients are assigned to one of three groups to receive either a onetime "risk assessment" or information on aerobic exercise or instruction in "primordial sound meditation," yoga, and ayurvedic dietary principles. The study will follow blood pressure, cholesterol, and general health status for one year. Since there are only 30 patients in each group, statistical principles dictate that it will be virtually impossible to detect any significant difference between the groups even if one exists. Cost: $30,000.

2) A study in which a group of "pray-ers" from Albuquerque, NM, will pray at least once per week for drug addicts in an experimental group. Success in curing the "prayed-for" of their addiction will be compared to a group "not prayed-for." Cost: $30,000.

3) A study of the effects of touch therapy on the immune system. The hands of the "therapists" do not actually touch the body, but "smooth out" a hypothetical "energy field" surrounding the body. Cost: $30,000.

4) Interviews with 1500 AIDS patients to ask what types of alternative therapies they use and how their disease is progressing. Cost: $1 million.[2,3]

5) A study, coordinated by Duke University, of 336 patients with major depression who will be randomized to eight weeks of treatment with either conventional antidepressants or placebo or St. John's Wort. The later is a perennial plant used for centuries as a folk remedy for a host of illnesses. Its efficacy and safety are not established. Cost: $4.3 million.[4]

To Bee or Not To Bee

How did these unusual undertakings acquire federal funding? The spigot of dollars was opened by the US Senate. Senator Harkin, who swallowed 250 capsules of bee pollen to treat his allergies several years ago, decided to push for the OAM "because [bee pollen] sure worked for me."[3] In addition to his disregard of the scientific method, Harkin received his bee pollen from Royden Brown of the C.C. Pollen Company. Brown had alleged that bee pollen capsules could cure heart disease, reverse the aging process, prevent memory loss, prevent premenstrual syndrome, improve sex activity, kill bacteria, and promote weight loss. Mr. Brown subsequently paid $200,000 to the Federal Trade Commission under a consent decree for false advertising.[2,3]

After establishing the OAM, Senator Harkin successfully pushed to have four alternative medicine "advocates" placed on the 18-member OAM advisory board. These included a gentleman who claimed to have been cured of prostate cancer by someone who invented a special microscope able to look "at blood samples and diagnose cancer well before a victim has symptoms." Another board member was fired from Memorial Sloan-Kettering Cancer Center's public relations office after he denounced the hospital for "covering up the benefits of laetrile." Yet another runs an organization called "People Against Cancer" and feels that "radiation and chemotherapy are extremely dangerous and they don't make people live longer."[2,3]

Dr. Halperin is *Journal* Deputy Editor and Professor and Chair, Department of Radiation Oncology, and Professor, Department of Pediatrics, Box 3085, Duke University Medical Center, Durham.

Who's Minding the Office of Alternative Medicine?

The original director of OAM was Dr. Joseph Jacobs. He resigned in 1994 after he complained about interference from congressional staffers pushing special interest projects as well as interference from Senator Harkin's appointees to the advisory board. The present director, Dr. Wayne B. Jonas, is a primary care physician and lieutenant colonel in the Army.[5] Dr. Jonas worked for one year in a research laboratory at Walter Reed Army Institute of Research. He is a proponent of homeopathy, a movement that traces its origins to Samuel Hahnemann's 1808 book, *Organon der rationellen Heilkunde.* Hahnemann thought disease was a disorder of the "vital force," which he contemplated as purely spiritual. Doctors, he said, should not concern themselves about the nature of illness, but only about its cure. "Maladies would be cured by administering in minute or infinitesimal doses those substances which in large doses were capable of provoking similar symptoms."[6] Homeopathy relies on the "principle of similars" (treating a symptom with a drug that produces similar symptoms) and the "principle of dilutions" (diluting a drug until no molecules of it are left; the remaining solvent "remembers" information from the drug).[7] Hahnemann's nonsensical remedies were useless but they were, at least, so profoundly diluted that they were nontoxic.

According to a recent article in *Scientific American,* Jonas was asked to repeat his internal medicine rotation at Wake Forest University's School of Medicine after he suggested homeopathic remedies for a patient with severe antibiotic-resistant pneumonia. While at Walter Reed, Jonas attempted to publish a paper asserting that a homeopathically prepared solution of bacteria produced immunoprotective effects in mice. Two laboratory supervisors declined to be coauthors. The paper ultimately was rejected by three immunology journals.[5]

In a recent *Lancet* article, Dr. Jonas and his collaborators reviewed 186 homeopathy trials. Looking at a range of conditions (asthma to stroke to otitis media to postoperative ileus) and a broad range of interventions (mustard gas, asafetida, pollen, etc.) Jonas and coworkers argue that the data favor a benefit to homeopathy and that "further research on homeopathy is warranted provided it is rigorous and systematic."[7] An accompanying editorial by Jan P. Vandenbroucke critiques the paper: "The problem with homeopathy is not that there is no explanation for its possible action. If there is no explanation for the action of an agent, one might still give it the benefit of the doubt under certain conditions. The problem with homeopathy is that the 'infinite dilutions' of the agents used cannot possibly practice any effect. A randomized trial of 'solvent only' versus 'infinite dilutions' is a game of chance between two placebos."[8]

Dr. Jonas manages a multimillion-dollar federal biomedical research agency, so I conducted a MEDLINE search to count his scientific publications in peer-reviewed journals. (My idea wasn't original. *Scientific American* similarly investigated Dr. Jonas in 1996.[5]) As of this writing, Dr. Jonas's research output consists of two letters to the editor, one review article, one article in the *Lancet*, and one preliminary study on nicotinamide in osteoarthritis. Dr. Jonas has penned a few reports on the mission and operations of the OAM, and is coauthor of a book: *Healing with Homeopathy: The Complete Guide.*

The Problem With Squandering Research Funds

Serious researchers are investigating the human genome, the causes and prevention of cardiovascular disease, oncogenes, mental illness, physiology, tumor suppressor genes, computers in medicine, cell signaling, pharmacology...the list goes on and on. Many others, in spite of receiving outstanding scores on grant applications, cannot do their work because there are no available funds. The OAM is far more than an amusing federal boondoggle; it is a shameful diversion of taxpayers' dollars to foundationless pseudo-science instead of biomedical research.

We have heard the standard defense of enterprises like the OAM: that because many patients use alternative home remedies, they deserve to be rigorously investigated. A recent defense of the St. John's Wort study claims that, "for several years the herb has far outsold Prozac in Germany as a treatment for depression."[4] This argument leaves me cold. A lot of things that people (including Germans) do are devoid of any scientific rationale. Such behavior is not, in my view, a reason to divert money away from serious science.

It is also argued that, because a large segment of the population places some credence in alternative therapies, we should systematically evaluate them to glean nuggets of useful biological information.[7] Perhaps some useful botanical pharmacology lies hidden in the panoply of folk remedies. Perhaps not. I believe that tax-supported research dollars would be better spent in rational drug discovery processes and medicinal chemistry than in highly speculative hunts for pots of gold at the end of root and herb rainbows.

Maybe the political will that generated the OAM reflects public dissatisfaction with medicine and science. If this is the case, the scientific community shares blame with the public. Scientists have not always explained their work to the public as well as they should. Public education has not raised the general level of scientific literacy or dispelled superstition and myth. And a general level of hypocrisy exists among physicians and a public that decries a lack of medical progress while simultaneously refusing to participate in rationale clinical trials.

The OAM isn't funny anymore. It consumes research dollars that could be put to good use. The last thing Congress needs to do is upgrade this sideshow to a "national center." What we, as thinking physicians, need to demand, and what Congress needs to do, is to abolish the OAM. ❑

Acknowledgment: *The author thanks Dr. Gustavo Montana for his helpful comments.*

Continued

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Comment *by Barrie R. Cassileth, PhD*

The term "alternative medicine" encompasses a vast variety of regimens and products, useful and otherwise. It is impossible to accept or reject the entire category because its components range from invasive and potentially harmful to soothing and beneficial. It helps to separate "alternative" therapies, which are promoted for use in lieu of mainstream care, and "complementary" therapies, which are used as adjuncts to mainstream care or as self-prescribed home remedies, typically used for self-limiting problems.

The OAM's $30,000 grants went to support pilot studies meant not to provide definitive data, but to identify research areas worthy of further investigation. The OAM's initial years were peppered with controversial problems and decisions. As the office organized and increasingly integrated its work with NIH institutes, with which it cofunds major projects, the scientific aspects of its research efforts grew increasingly sound. St. John's wort is a good example. Hundreds of studies conducted in Germany and elsewhere in Europe support the value of this herb in treating mild and moderate depression, but important questions remain. Some of these questions will be addressed in research under way at the National Institute of Mental Health as well as in the investigation to be coordinated by Duke University.

The OAM was established, albeit in unorthodox fashion, to promote appropriate investigation of unconventional treatments because the NIH seemed less open to their study than many wished. The ultimate goal of the OAM, like that of cancer treatment centers, should be to disband for lack of need. Worthy unconventional therapies and promising complementary techniques should be pursued, researched, and funded by the NIH institute most relevant to the particular therapy. Hopefully, this will occur in the future, negating the need for a separate office to address what many see as quasi-scientific issues.

In addition to the public dissatisfaction with medicine and science correctly targeted by Dr. Halperin, complementary medicine itself exerts a strong appeal. This is a multibillion dollar industry in the United States. As Dr. Halperin notes, public education has not dispelled superstition and myth, and many people are drawn to the magical components of some unconventional therapies. A majority of the US public believes that angels hover nearby to help with life's problems. It is difficult to attribute such widespread beliefs to the educational shortcomings of science or scientists. Carl Sagan and many others worked hard and creatively to instill respect and appreciation for rational thinking. Some popular alternative therapies, such as those invoking a vital force energy unknown to science or the magical ability of chants and crystals, seem to offer comforts usually attained through spirituality and religion. Some alternative medicine, I believe, attracts public interest and money precisely because it fosters a sense of connection with others across time and space and the reassurance of magical protection.

Many complementary therapies, however, warrant our attention. By subjecting worthy alternative and complementary therapies to scientifically rigorous studies, we can hope to move those therapies away from the mystical and see them for what they are: testable modalities of potential benefit (or worthlessness or harm) to be accepted or rejected on the basis of scientific inquiry.

Dr. Cassileth is Adjunct Professor of Medicine (Oncology), UNC, Consulting Professor, Community and Family Medicine, Duke University, and Visiting Lecturer in Medicine, Harvard University. She was a founding member of the Advisory Council to the NIH Office of Alternative Medicine and is a member of the American Cancer Society's committee on alternative medicine. She wrote the recently published Alternative Medicine Handbook: The Complete Guide to Alternative and Complementary Therapies *(WW Norton & Co., 1998).*

Continued

Comment by James R. Dykes, MD

I am honored that the editor of the *Journal* invited me to respond to Dr. Halperin's call to abolish the OAM. I guess I am not surprised by Dr. Halperin's vehement opposition to the study of prayer, diet, meditation, healing touch, homeopathics, and herbal medicines, but I am alarmed by it. There are important questions to be answered about health and healing, and I say thank goodness we have someone in government who is willing to ask them.

The origin of the rise in what Dr. Halperin calls "alternative health care" is in the hearts and minds of our patients. They have not forgotten the need to be touched, to be listened to, to be cared about, or to be prayed for. That they are willing to spend billions of dollars out-of-pocket to be so nurtured is a testament as to how they thirst in our current managed care desert. During the past decade, the insurance industry has successfully insinuated itself between doctor and patient. In the name of "managing" health care costs, doctors have been asked to act as "gatekeepers," a role that in many instances places them at odds with the wants and needs of their patients. Never in the long history of medicine, except perhaps in time of war, has so little time been devoted to listening to the patient. Is it possible that the rising popularity of alternative health care reflects patients' needs to be cared for in ways that no longer seem possible in doctor's offices?

Dr. Halperin's chief concern seems to be to protect funds for what he calls "legitimate scientific inquiry." I am certainly not against continued study in the direction of his passions, but to ask questions of fundamental importance about the mysteries of healing seems equally important. We have no satisfactory treatment for many chronic illnesses. The relief of suffering is part of the call of medicine, and that makes it worthwhile for our society to look into the effectiveness of popular and relatively inexpensive alternative therapies that do that. Funding decisions need not be limited by Dr. Halperin's either-or logic. Ask the patients; they want answers to the questions the OAM is asking.

Many doctors feel as though they are working on an assembly line: diagnose and prescribe, diagnose and prescribe—in 12 minutes—on and on, *ad infinitum*. They need but do not have the time to think about solutions more complex than drugs or tests. As physicians we must be able to give the gift of ourselves, our presence, our kindness. We must stay open to new ways to relieve suffering and promote healing. The scientific method has taken us a long way. Shouldn't we bring that useful tool to the study of alternative medicine?

It would be nice to know whether, as the Germans contend, St. John's wort is as effective as Prozac in treating depression. Think how wonderful that would be for our society, which as Dr. Halperin knows, is suffering from epidemic depression. It would certainly be cheaper, and perhaps safer, but more importantly, this nontoxic herb would be available over the counter to anyone, regardless of their ability to pay for physician care. I think that $4.3 million to study its efficacy is entirely justifiable, and I am delighted Duke will be conducting the study. If Dr. Halperin is correct, that the OAM is conducting silly and useless studies in a frivolous manner that will not, in the end, prove anything, he should be relieved that a prestigious institution like Duke University will be doing significant and rigorous research in alternative medicine. Research does cost money, but ultimately it will be more valuable to have unambiguous answers to the kinds of questions the OAM is asking. I cannot speak to the issue of leadership, but I believe expanding the budget of the OAM and elevating it to the stature of a National Center of Integral Medicine are good ideas.

Dr. Halperin has been working too long behind a lead wall. His call to abolish the OAM is far removed from the will and interest of the people. Our patients need and expect more from us. Physicians are teachers, and like Dr. Halperin I am dissatisfied with how we have performed in this role. There is so much we could teach; we must begin today. We must begin by looking with a skeptical but open eye at the many nonstandard treatments patients say help them when they are in trouble.

Dr. Dykes established his solo practice, Integrative Health Care, in Durham in 1987. A Duke University medical school graduate, he is a fellow of the American Academy of Family Practice.

Comment by Ronald B. Mack, MD

I agree with many of the points offered by Dr. Halperin, but I do not agree that we should abolish the OAM. Instead of abandoning a potentially useful service to the nation, let us be advocates for changing it. We could begin by suggesting that the leadership have proper credentials. The most basic requirement would be that the head of such a program know about the scientific method and have published articles that indicate such knowledge.

Furthermore, the allocation of funds by the OAM should be for studies based on proper scientific and statistical principles as all reasonable clinical investigation requires. The OAM should have an active advisory board composed of allopathic physicians and representatives of the various segments of the alternative medicine community.

Now, more than ever, we need to scrutinize forms of treatment that more than 34% of Americans believe in. Some alternative medicine techniques have been around for millennia, but the number of Americans who now embrace these techniques is staggering. For example, an estimated 60 million of our citizens have used herbal remedies, despite near total lack of information about their effects and dangers. On November 24, 1997, the Presidential Commission on Dietary Supplement Labels called for more research on all dietary supplements, including vitamins, minerals, botanicals, and amino acids.

There is a hard lesson for us in the use of nontraditional medical techniques by so many people: We physicians are not giving patients what they expect from us. True, we offer them access to technology and more medications, but they apparently miss our "touch" and our caring for them as people, not illnesses. Our predecessors had little in the way of effective medicines but their patients loved and respected them. We get little respect and less admiration.

It's quite likely that good science can prove or disprove the value of alternative medicine techniques. Just by doing those studies we can start to win back some of our lost respect. We will show our patients that we care enough to investigate nontraditional treatments in order to protect them, improve their health, save them money, and teach them to critically evaluate what practitioners do to their bodies. Preserve the OAM, but make it conform to medically accepted scientific rules.

Dr. Mack is Professor, Department of Pediatrics, Wake Forest University School of Medicine, Winston-Salem. He writes the "Toxic Encounters" series for the Journal, *and is a member of the* Journal's *Editorial Board.*

Comment *by Marty Sullivan, MD*

I read with interest and concern Dr. Halperin's proposal for the OAM. I agree with him that the research effort has in some cases been somewhat speculative and that the initial publication record of the OAM has been limited, but I would point out that much of this was due to a funding mandate requiring that a complementary/alternative medicine practitioner initiate each study. This generated a plethora of small pilot studies. The OAM found that this system does not really work and does not produce peer-reviewed publications. The new director, Dr. Jonas, is reversing this trend. Present funding is going to more experienced investigators from established academic settings. I believe that we will begin seeing a better publication record as a result of OAM funding.

History has shown us that what we consider to be alternative or complementary today sometimes becomes mainstream tomorrow. Treating coronary artery disease using a low-fat, vegetable-based diet, exercise, and stress management was considered "on the fringe" in the early 1980s. Now this program has been proven effective in several well-controlled trials and is slowly gaining acceptance by clinicians. Next year the Health Care Financing Administration will study the effects of this approach in 2000 Medicare patients with angina.

The St. John's wort study is a good example of the research possibilities of the OAM. St. John's wort is a very popular herbal remedy for depression in Europe. I agree with Dr. Halperin that it has not been conclusively proven safe and effective; if it had been, then another study would be unnecessary. But there is a robust database suggesting efficacy that warrants a larger more definitive trial. At least a dozen randomized, controlled trials in Europe have found this herb as more efficacious than placebo in treating depression—and without the often-troubling autonomic side effects. Testing the effectiveness of St. John's wort is a well-conceived and important research effort that may benefit thousands of depressed patients.

One of the difficulties faced by the OAM is that treatments based on common usage or folk tradition usually do not come with scientific explanations of how they might work. Many probably work through placebo mechanisms or suggestion, but it is likely that some have important physiologic effects, which have simply not yet been elucidated. In any case, not knowing the mechanism of action of a treatment does not necessarily invalidate the clinical results. At present, quantum scientists really don't understand how gravity works. Does that mean we don't believe in it?

The most important element in the success of modern medicine is its reliance on objective data derived using the scientific method. I suggest that the collection of objective data about complementary/alternative medicine by experienced research scientists is a worthwhile endeavor that is likely to yield useful results that can be translated into improved patient care.

Dr. Sullivan is Associate Professor of Medicine, Division of Cardiology, and Director of the Integrative Medicine Initiative, Duke University Medical Center. He participated in two Integrating Mind, Body, and Spirit in Medical Practice Conferences held in the Triangle area in 1996 and 1997.

Continued

Comment by Andrew T. Weil, MD

Why do we have an OAM? Certainly not because the powers that be at NIH wanted it. Most of them resent its presence and privately call it the Office of Astrology. Nor is it there just because Senator Harkin had a favorable response to bee pollen therapy for allergic rhinitis. OAM exists because members of the US Congress responded to constituents' demands to know why the federal government was not doing anything to study kinds of treatments that are tremendously popular with people in this country. Those treatments are popular with many intelligent, thoughtful people who understand science and its limitations but are increasingly frustrated with physicians' ignorance of interventions other than pharmaceutical drugs and surgery.

Surveys consistently show that 30%-40% of Americans use alternative medicine, but most of them do not tell their physicians about it. The reason is obvious: patients do not want to be ridiculed—and that has been the reflexive response of most physicians when patients try to talk to them about herbs, vitamins, visualization, and the rest. This lack of trust and communication is not in the interest of good medicine, if only because adverse interactions are possible. For example, untoward bleeding has occurred in patients on prescribed anticoagulants who also took high doses of vitamin E or large numbers of garlic pills, both of which have anticoagulant effects.

The proposition that physicians should not be informed about the whole range of alternative therapies, whether or not they choose to use any of them, seems to me indefensible. For more than 20 years I have been teaching medical students at the University of Arizona about alternative medicine, trying to instill in them a spirit of open-minded skepticism toward ideas and practices they do not even hear about anywhere else in the curriculum. I also direct a Program in Integrative Medicine to train postgraduate fellows and physicians-in-practice in what I believe will be medicine of the future, medicine that will address the demands of patients. This work cannot proceed without research to weed out the worthless, nonsensical, and harmful from what is worth incorporating into our practices.

I am not an uncritical proponent of alternative medicine; I advocate the intelligent synthesis of the best ideas and practices of all systems of treatment. St. John's wort is attracting attention here—finally—not because it outsells Prozac in Germany but because good clinical studies in Germany indicate that it works as well as Prozac (and has less toxicity) in mild to moderate depression. Dr. Wayne Jonas's meta-analysis of studies on homeopathy in the *Lancet* concluded that effects of homeopathic remedies cannot be explained solely by placebo mechanisms. We cannot insist on evidence-based medicine and then ignore or reject evidence that comes in against our preconceptions.

One may argue that OAM has not been well administered or that its research money has not been well spent, but to argue that the Office should be abolished is to accentuate the close-minded attitude that drives patients away from our profession. I say increase its budget, elevate its status, and charge it with sorting out what is interesting and useful in the world of alternative medicine from what is not.

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"Goodbye to the Life I Used to Live"

St. John's Wort

Ronald B. Mack, MD

I have always liked Emily Dickinson and her very expressive poetry, and I believe she would have liked me as well. Admittedly, she was a little bit strange, but she had a way with words; she and Walt Whitman are considered, by many, to be the two most gifted poets in American literature. The "Belle of Amherst" wore white clothes every day of her adult life but was never a bride. Critics believe that she considered death and eternity the "lover" referred to in her greatest poems.[2] Emily was not always a happy camper. Possibly, if she had gone into her backyard to harvest and eat some St. John's wort she would have experienced more joy. This plant was available in her lifetime but Prozac was not.

A Feel-Good Herbal Remedy

Of late, *Hypericum perforatum*, the plant known as St. John's wort, has become popular among our citizenry. Health food purveyors have trouble keeping it stocked, so intense is the demand. We are after all a people who want to "feel good" all of the time. What better solution than a substance that allegedly can make you feel happy without having to see an MD?

This herb remedy has been used as medicine for the past two millennia, beginning as an agent to hasten wound healing. The plant received its unusual name from the early Christians who named it in honor of John the Baptist.[3] According to legend, on August 29, the anniversary of this saint's unfortunate decapitation, the plant releases its blood-red oil. (And "wort" is Old English for "plant.")

Our old friend Pliny said it would cure the bite of poisonous snakes. It was recommended as well for burns and malaria, as an emmenagogue (menses initiator), as a diuretic, and of course, as protection against witches' spells (which was the way our family used this substance). Early Christians, adopting the pagan beliefs, burned the plant in bonfires on St. John's Eve to repel evil spirits. Since the beginning of the Christian Era, there have been a myriad of references to the use of St. John's wort against bruises, wounds, kidney stones, diarrhea, menstrual irregularities, hemorrhoids, and mopery (I made this last condition up; it was my father's favorite abnormal state; he claimed it referred to anyone who "moped" [did nothing] when they were supposed to be working").

The most recent interest is in using St. John's wort as a remedy for depression. During the past year its use and fame for this purpose has, at least in this country, created a multimillion dollar business phenomenon. The questions we, as health care professionals, need to ask are: How does it work? Is it effective? Is it safe?

The Biology of Depression

To answer the question about how St. John's wort might work, we need to look at the current theory of the causation of depression. Apparently, in order for us to avoid a constant state of depression, we depend on our body to produce serotonin. Most of us are aware, or should be, that the brain uses neurotransmitters (serotonin, dopamine, norepinephrine, and many, many others) to process information and to send instructions to various parts of the body. Neurons do not actually touch one another. They are separated, (as you recall from Neuroanatomy 101) by synapses. Vesicles at the ends of neurons store neurotransmitters for release when an electrical signal reaches the vesicle. The neurotransmitter molecules traverse the synapse to lock on to receptors on an adjacent nerve cell. This transmits the impulse. Once their mission is completed, neurotransmitter molecules detach and are carried back to be reabsorbed or destroyed.

Serotonin apparently gives an emotional tone to information coming in to a person. This substance (5–hydroxytryptamine, or 5–HT) also acts an effector on various types of smooth muscle and enhances platelet aggregation.[4,5] Many brain functions are influenced by 5–HT: appetite, sexual behavior, sleep, cognition, motor activity, temperature regulation, and nociception (the capability to appreciate or transmit pain). It seems that serotonin can affect almost all of our emotions from

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satiety to depression. At this stage in our understanding the function of 5–HT in depression, we know that certain drugs prevent certain nerve cells from reabsorbing serotonin that is already in circulation. We also know that there are several serotonin receptors; some are associated with weight gain, hallucinations and of course, depression. Exactly what St. John's wort might do is controversial. Some investigators believe that hypericin strongly inhibits the enzyme monoamine oxidase; others believe that it inhibits the uptake of serotonin by postsynaptic receptors. Either or both would make more serotonin available in the brain for longer than usual, thus boosting its mood-elevating effects.

> "Some investigators believe that hypericin strongly inhibits the enzyme monoamine oxidase; others believe that it inhibits the uptake of serotonin by postsynaptic receptors."

Can Wort Work?

St. John's wort is an erect perennial herb, one to three feet tall, distributed throughout the United States and Canada as well as Australia, North Africa, and Europe.[6] It is an invasively spreading perennial that has an aroma like turpentine. Its leaves are dotted with glands that produce a red oil. The flowers are star-shaped and bright yellow in summer. To collect the plant for personal use, the entire plant above ground should be obtained and dried as quickly as possible. The flowering tops of the herb have the highest yield of the major biochemical agent, hypericin.[7] Other chemical constituents include an essential oil containing caryophyllene, methyl-z-octane, n-octanal, n-decanal and b-pinene, prenylated phloroglucin derivatives, pseudohypericin, and hyperforin.[8] In addition to its highly touted use as an antidepressant, it has been used for many, many years as an astringent and as an anti-inflammatory, antiviral, antibacterial agent.

It is easy to dismiss St. John's wort as just another herb-of-the-month, but this one has been around for a long time. Europeans, especially the Germans, love the stuff. In 1994, German physicians prescribed almost 66 million daily doses of preparations containing hypericum alone.[9] I forgot to mention that people who use this herb internally can take it in the form of tablets, liquid, or as a tea. It appears to be quite safe, and has stood the test of time, even if taken long-term, but should be avoided during pregnancy.

A recent issue of the *British Medical Journal* has a request[9] from De Smet and Nolen of the Netherlands asking for more scientific studies of this herb as an antidepressant. The authors correctly suggest that hypericum extracts should satisfy the same rigorous standards that are applied to synthetic antidepressants. There is a long article[10] in the same *BMJ* ("St. John's wort for depression: an overview and meta-analysis of randomized clinical trials") which analyzes 23 randomized clinical trials studying 1757 outpatients with mild or moderately severe depression. The authors of that review conclude that there is sufficient evidence to say that extracts of hypericum are more effective than placebo for the treatment of mild to moderately severe depression. They suggest the need for further studies comparing hypericum extracts to standard antidepressants in well-defined groups of patients, and comparing different extracts and doses. They stress the fact, well known among health care professionals, that depression is a very common disorder in the US with an estimated lifetime prevalence of 17%. Speaking for myself, and I hope most of you, it is about time that science gets used to prove or disprove the usefulness of this herb or any other alternative medical regimen. Currently it is prescribed 25 times more often than Prozac in Europe, but that does not mean it is a better choice.[11] The usual dose is 300 mgm of purified extract (approximately 0.3% of the active alkaloid, hypericin,) three times daily.

The most commonly reported side effects of St. John's wort (and they are uncommon) are gastrointestinal symptoms, allergic reactions, and fatigue. To avoid a more serious reaction, users of St. John's wort should avoid MAO-inhibiting drugs as well as amphetamines, tryptophan, tyrosine, narcotics, nasal decongestants, inhalant asthma medications, and "cold" and hay fever remedies.[3] Wait! There are more restrictions! To wit: no St. John's wort if you consume beer, coffee, wine, salami, yogurt, chocolate, smoked or pickled items, or fava beans. Now *that* is depressing! As a final warning, photosensitization is a real possibility in fair-skinned people and for them, as for vampires, sunlight should be shunned.[7]

> "... it is about time that science gets used to prove or disprove the usefulness of this herb or any other alternative medical regimen."

Help for Ron and Emily

The Chicago Cubs once again finished at the bottom of their division last season, and I am depressed. I plan on going into my backyard to harvest some of these beautiful, yellow, star-shaped flowers. Then I will make a tea of them and seek solace. I feel perfectly sane, but I cannot help shouting: "Help, the paranoids are chasing me!"

Apparently, Emily Dickinson did not take my suggestion to drink a cup of tea prepared from the herb in question (pour a cup of boiling water onto 1-2 teaspoons of the dried herb and infuse for 10-15 minutes TID. Her poem, as cited in the title, concludes: "Good-bye to the Life I used to live and the World I used to know—And kiss the Hills for me, just once—then—I am ready to go!"[1] ❑

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FOR PATIENTS

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Health Watch

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Eating Disorders: Effective Treatment Through Understanding

WHAT PATIENTS WANT PHYSICIANS TO KNOW

Steven H. Deters, PhD, LP, HSP-P

The eating disordered patient poses numerous treatment challenges for the physician. It is rare that the patient will seek treatment for the eating disorder, but may be brought by family members, or significant others, who are concerned about the patient's habits with eating and exercise, and apparent diminishing health Other points of entry into the healthcare system include routine physical examinations, presentation for treatment of other complaints, or through the emergency department due to dehydration, low blood sugars or syncope, uncontrollable vomiting, or diarrhea with gastrointestinal bleeding.

Assessment questions relevant to the potential presence of an eating disorder, especially those having to do with nutrition, purging, laxative use, weight and exercise, will generally be responded to with evasion, minimizing and denial. Denial and non-compliance with recommendations are hallmarks of eating disorders.

The two most frequently encountered eating disorders are bulimia and anorexia nervosa. It is not uncommon for the patient to have met the diagnostic criteria for both disorders at different times in their lives, generally beginning in early adolescence.

DSM IV - Diagnostic Criteria for Anorexia Nervosa

A. Refusal to maintain body weight at or above a minimal normal weight for the age and height (e.g., weight loss leading to maintenance of body weight less than 85% of that expected, or failure to make expected weight gain during period of growth, leading to body weight less than 85% of that expected).

B. Intense fear of gaining weight or becoming fat, even though underweight.

C. Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or denial of the seriousness of the current low body weight.

D. The absence of at least three consecutive menstrual cycles.

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Diagnostic Criteria for Bulimia Nervosa

A. Recurrent episodes of binge eating characterized by both of the following:
   1. Eating within any 2-hour period an amount of food that is definitely larger than most people would eat during a similar period of time.
   2. A sense of lack of control over eating, a feeling that one cannot stop eating or control what or how much one is eating.

B. Recurrent inappropriate compensatory behavior in order to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics, enemas, or other medication; fasting; overexcessive exercise.

C. The binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for three months.

D. Self-evaluation is unduly influenced by body shape and weight.

E. The disturbance does not occur exclusively during episodes of Anorexia Nervosa.

Estimates of the prevalence of anorexia and bulimia vary greatly, depending on the setting and population that is being evaluated. The DMS IV cites prevalence figures of 1-3% for bulimia among adolescent and young adult females, with a rate of occurrence among males of approximately one-tenth of that among females. The same source cites a prevalence of .5-1% for anorexia among females with no corresponding information as to prevalence in males.

Current practice trends would indicate much higher prevalence rates among females, especially in middle, high school, and college populations, where estimates run as high as 25%. Professions which stress image, high achievement, and service to others also are characterized by higher prevalence rates of eating disorders.

Eating disorders are severe, progressive, and may result in long term health impairment and premature death, without treatment.

Physical Signs for Evaluation of an Eating Disorder

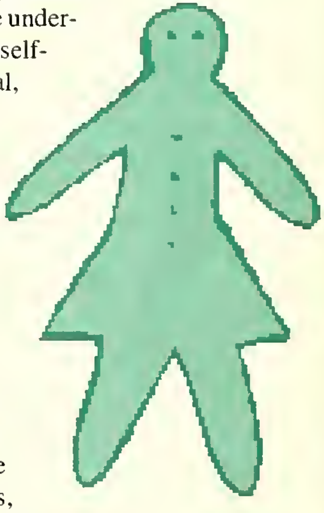
Routine blood work is generally ordered to evaluate electrolyte levels and blood sugars, with urinalysis to detect protein and ketones in the urine. Evidence of suppressed metabolic rate should be investigated, as eating disordered patients often exhibit hypotension, bradycardia, and arrhythmia. Evidence of purging can be indicated by swollen parotid salivary glands and Russells signs, as well as dental erosion. Patients with anorexia often exhibit growth of fine hair on their bodies (called lanugo hair) and complain of increased sensitivity to cold. In both anorexia and bulimia, patients experience vertigo, increased fatigue, concentration deficits, and peripheral edema. Purging through laxative abuse is common with many patients (ingesting between 15-50 laxatives on a daily basis) resulting in numerous gastrointestinal problems and complaints.

What Eating Disordered Patients Want Their Physicians to Know

Eating disorders develop to serve as mechanisms to cope with inner pain and a sense of inadequacy. They provide a means of self medication through alteration of neurotransmitters, especially serotonin and the endorphins which are altered through exercise, bingeing, restricting, and purging behaviors. Attempts to treat an eating disorder without addressing the core components of the syndrome are likely to fail

Physicians, nurses, and dietitians, who themselves struggle with their own eating disorders, report that education is ineffective due to the cognitive and perceptual distortions, which are integral components of the disorders. Until other more functional means of coping and true support systems with others are established, there will be an inability, or at least, strong resistance, to follow recommendations geared toward weight and health restoration.

Short-term hospitalizations with the goals of restoration of weight and fluid balance are generally followed by rapid relapse, unless there is adequate outpatient therapy and follow-up. Patients readily admit to strong motivation to meet discharge criteria, (e.g., weight gain) in order to be able to resume eating disordered behaviors following discharge from the hospital. The advent of managed healthcare has greatly reduced patient accessibility to longer-term inpatient eating disorder programs, which address the underlying issues, including: low self-esteem, physical, emotional, and sexual trauma; dysfunctional family relationships, and perfectionism.



Twenty years of experience working with eating disordered patients, in both inpatient and outpatient settings, has clearly demonstrated that eating disorders have a developmental basis. They are biopsychosocial disorders, which in each sphere must receive skillful intervention for successful recovery.

The person with an eating disorder possesses an inner core sense of inadequacy, shame, and of being truly alone. For various reasons, they have come to believe and feel that positive emotional connectedness, or love, is conditional on high achievement, being able to alleviate family stress and discord, having a "perfect" body, and not imposing their needs and emotions on others. They have generally suffered in silence, out of service to others, during their childhood and early adolescence. The experience of the patient is that no matter what she/he accomplished, it was not good enough to receive approval which is seen as a prerequisite for love in a way which could be experienced. The outward presentation is generally one of contentment, and the eating disorder becomes the means of coping with inner feelings of emptiness, anger, and guilt. As the eating disorder progresses, an inner dialogue emerges between the self and what patients refer to as the "monster," the eating disorder.

The following narrative graphically illustrates the progression of the disorder and emergence of the inner dialogue.

When the eating disorder begins, it is like a friend that provides a means of control and comfort. As the weight comes off, people make approving remarks of admiration, and question how you can do it when they struggle so hard. At last, here is an area in which you can succeed and be in control. The proof can't be denied, because others can see it. It feels good, but it is not enough to fill the emptiness inside or erase the feelings of inadequacy. Maybe just a few more pounds. As each goal is reached, another goal is set — because it is not enough.

The friend that once provided a means of control, becomes a monster that takes control. It talks to you in ways you may know are not true, but you feel powerless to resist. Although you know a lot about nutrition, it seems like what you know applies to everyone else, but not you. Other people become concerned about you and tell you that you look fine or you've gotten too skinny and need to eat more. When you look in the mirror you don't see what others see; the monster shows you fat or where you need to lose more. The monster tells you that others are envious of your weight loss and want you to be fat, which leads you to diet even more. It still is not enough. When you do eat, you feel so guilty and undeserving, it tells you that there is a price to pay. Get rid of it, exercise, eat less next time.

As the eating disorder progresses, you notice that you get tired more easily, your concentration slips, dizziness sets in, and you feel more and more alone. These are a result of the eating disorder, but the monster screams that you are incompetent, unlovable, evil, and stupid. You deserve to eat even less. Just a few more pounds and everything will be fine. It is never enough.

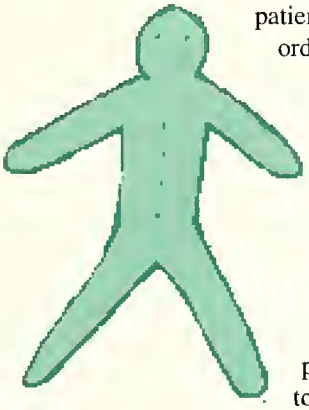
If only other people could understand what it is like. How the monster screams when they make comments like: "Why don't you just sit down and eat with the family?"; "We need to fatten you up."; "How can it be so hard to just eat?"

When people ask questions, try to give advice, or make comments, it is like you are pulled out of the conversation and they face the rage of the monster. Then you're back, feeling guilty, and even more inadequate for the anger they've caught. It becomes even harder to eat. You may find that foods that are fat free and low calorie, which you used to eat, you can't eat anymore. It's not about weight — you used to enjoy them and because you enjoyed them you feel you don't deserve to eat them.

It should be evident by now that although the diet was the trigger, the stage had been set. The eating disorder provides a means of coping with feelings of low self-esteem, inadequacy, guilt, lack of control, and distance from others. What at first seemed like the solution becomes a problem. You can't be thin enough!

The Treatment Process

Recovery from an eating disorder will generally require one to one-and-a-half years of treatment, with decreasing frequency of visits as progress is made. It is imperative to realize that in early stages of treatment, resistance encountered is often a matter of ***can't*** rather than ***won't*** comply with the prescribed regimen, due to the compensatory functions of the disorder and powerful secondary gains. This is further complicated when the patient is truly in denial of the disorder.



Effective outpatient treatment for eating disorders generally involves the establishment of a coordinated treatment team, consisting of the physician, psychotherapist, and dietitian. Frequent communication and coordination are important to provide consistency to the therapeutic process.

The physician is often the first to encounter the eating disordered patient. Completion of the physical examination and laboratory work will rule out the possibility of physical disorders which may result in syndromes similar to an eating disorder. Once this has been accomplished, a supportive discussion with the patient and family members elucidates that the weight, eating behaviors, purging and exercise patterns are not the true problems for which the patient needs assistance, before true progress can be made with the disordered eating. It is most important to employ a "no-fault" supportive orientation in explaining that the patient has developed these patterns in a reactive coping manner.

The physician makes a referral to a psychotherapist and dietitian experienced in treating eating disorders. Regular rechecks are scheduled to monitor progress as indicated through changes in vital signs, lab work, and weight fluctuations. It is the role of the physician to set thresholds for participation in activities such as athletics, exercise, and for hospitalization, based on the physical health of the patient.

The psychotherapist works with the patient and the family to uncover the functions the eating disorder has been serving, and to improve communication among family members of support for the patient. Cognitive behavioral interventions are employed to alter distorted conceptual and perceptual systems. Much work is devoted to enabling the patient to establish mutually supportive relationships through the combination of individual, family, and group therapy.

The role of the dietitian is to thoroughly assess the patient's current eating behaviors, nutritional content, and exercise patterns. Beginning with the baseline obtained, gradual changes are recommended with minor alterations progressing to more major changes as progress is made on resolution of the underlying issues in therapy.

The course of effective treatment will provide numerous slips or relapses, which are framed as learning experiences. The triggers for the slips and relapses are identified and alternative coping actions are explored for future similar situations. It is important at all times to be aware that the eating disorder is a functional coping mechanism which will not relinquish until other means of coping are established.

How Can Family and Friends Help?

1. Educate yourself. Read as much as possible about eating disorders, so you can help the person with the illness understand his/her problem. Talk with a professional who works with patients with eating disorders. The more you understand about the nature of the illness, the more you will be able to help.
2. If you think someone has an eating disorder, express your concerns in a forthright, caring manner, preferably when you both are calm and not pressured by time. Encourage the person in a non-threatening, non-judgmental manner to seek professional help.
3. Be prepared for a defensive response or an outright denial of the disorder. She may be resentful of your intervention, but emphasize that since you care for her, you cannot ignore this destructive behavior.
4. Set realistic goals. Do not expect an overnight change. Eating disorders are complex and recovery is a gradual process. Nagging and criticism are not helpful and may make someone secretive. You cannot make the patient stop starving, etc., but you can listen to his/her feelings and offer your support.
5. Move the focus of your concern away from food and weight issues as soon as possible. Avoid commenting on what she eats or how she looks. Food and weight is not the problem.
6. Isolation and avoidance are common. Don't stop including her in your activities, even if she keeps refusing.
7. Promote the idea of being "healthy," instead of emphasizing size or weight.

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Fatal Inhalation of Volatile Substances in North Carolina

Butch Huston, MD, and John Butts, MD

Self-intoxication by solvent inhalation has been known since World War I. This form of drug abuse continues to increase in popularity.[1,2] Intoxication occurs within 15 minutes of inhalation and lasts for 45 minutes, but the "high" can be maintained by repeated inhalation. Hallucinations, ataxia, confusion, euphoria, and loss of inhibition are dose-dependent effects of the inhalation.[2,3] Solvents (dry cleaning and cigarette lighter fluids, aerosol propellants, and gasoline) are usually poured into a plastic bag or other container and sniffed or deeply inhaled through the mouth and nose (huffing). Air exhaled into the plastic bag can be rebreathed, adding hypercapnia and hypoxia to the effects of the drug.[2] Sudden death can occur after inhalation, in part because the volatile substances sensitize the heart to catecholamines, precipitating arrhythmias.[2,4]

We reviewed the records of the North Carolina State Medical Examiner's office and identified 19 fatalities caused by inhalation of volatile substances between June 1991 and November 1996. One death was an industrial accident, but the remaining fatalities were due to recreational use. We summarize our findings in this report.

Results

Table 1, next page, summarizes the 19 recorded deaths due to inhalation of volatile substances. Eighteen victims were male, and 17 were white; their average age was 19. In 18 of 19 cases, the drugs were inhaled for recreation, but in one, argon gas leaking into a painting booth at a truck manufacturing plant was inhaled accidentally and led to asphyxiation. These solvents were inhaled on purpose: gasoline (four cases), propane (two cases), air freshener (Glade® in two cases and Renuzit® in one), butane/lighter fluid (three and one cases), freon (two cases), Teflon® spray (one case), Scotchguard® fabric spray (one case), and fire extinguisher contents (one case).

Only five (26%) of the victims were actually seen inhaling volatile substances prior to death. The cause of death in the remaining cases was determined by finding an inhalant or inhalation paraphernalia adjacent to the body or by a history of prior drug abuse and positive toxicological examination. Nine victims (47%) had a history of either illicit drug use or solvent inhalation. In 17 of the 19 cases (89%) death occurred suddenly; in the remaining two cases death was due to drowning or anoxic brain injury. Autopsy, performed in 17 cases, often showed pulmonary congestion, edema, and intraalveolar hemorrhage. Aspiration was found in two cases; focal myocyte necrosis and thermal burns were identified in one case each. In one case there was peripancreatic hemorrhage, diffuse petechial hemorrhage of the cerebral cortex, serosa of the gastrointestinal tract, and pulmonary edema. Two patients exhibited cardiomegaly, but only one had a history of prior volatile substance abuse. Autopsy was not performed in two cases because the death was not reported to the medical examiner prior to burial.

Illustrative Cases

1) A 29-year-old man (Case 4) was found by his family in a locked workshop. He was partially clothed. Fresh semen and pornographic material were found near the body. A hose connected to a propane tank was found adjacent to the body. No autopsy was performed, but the blood concentration of propane was sufficient to cause death.

2) A 29-year-old man (Case 5) was found lying face down and unresponsive in the paint booth of a truck manufacturing plant. He was wearing a paint helmet with an attached air hose, but the hose had been incorrectly installed and was connected to an argon gas outlet, not air. Autopsy revealed pulmonary edema, congestion, and intraalveolar hemorrhage.

3) Police officers found a 19-year-old man (Case 6) sitting in his car on a college campus. After the officers had talked

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Table 1. Volatile substance deaths in North Carolina, 1991-1996

Case	Age	Sex	Race	Substance	Death witnessed	Autopsy findings	Scene	Drug history
1	23	M	W	1,1,1 trichloroethane (Scothguard®)	No	Pulmonary congestion, edema, focal atelectasis, hippocampal hemorrhage	collapsed in street	previous use
2	16	M	W	Trichlorofluoromethane (freon)	Yes	Pulmonary edema, congestion	plastic bag present	none
3	22	M	W	Dichloromethane (Teflon® spray)	No	Pulmonary edema, congestion	plastic bag present	previous use
4	29	M	W	Propane	No	Not performed	propane tank with hose, autoerotic scene	none
5	29	M	W	Argon	No	Pulmonary edema, hemorrhage, congestion	collapsed in paint booth of manufacturing plant	none
6	19	M	W	Propane/isobutane (Renuzit®[1])	No	Pulmonary edema, hemorrhage, congestion	plastic bag, saturated towel present	none
7	15	M	W	Gasoline	No	Pulmonary edema, congestion, aspirated gastric contents	found in pool, gas can on patio	previous use
8	20	M	W	Gasoline	No	Pulmonary edema, congestion, cardiomegaly	found in yard	previous use, illicit drug use
9	22	M	W	Bromochlorodifluromethane (halon, fire extinguisher)	Yes	Pulmonary edema, hemorrhage, congestion	collapsed after discharging extinguisher	previous use
10	18	M	W	Gasoline	No	Pulmonary edema, congestion	lying on ground near car, gas cap on trunk lid	previous use
11	16	F	W	Propane/butane (Glade®[1])	No	Pulmonary congestion, edema, aspiration	lying on floor of living room in vomitus	previous use
12	15	M	W	Butane (lighter fluid)	Yes	Pulmonary edema, congestion	collapsed at beach, with friends	none
13	15	M	W	Propane/butane (Glade®[1])	No	Pulmonary congestion, edema, intraalveolar hemmorhage, focal myocyte necrosis	can of air freshener, towel in a bag	marijuana abuse
14	11	M	W	Chlorodifluoromethane (freon-22)	No	Pulmonary congestion, hemorrhage, aspiration, thermal burns	freon tank with hose present	none
15	17	M	B	Butane, guaifenesin, Dextromethorphan (Robitussin®)	Yes	Pulmonary hemorrhage, congestion, edema, myofiber eosinophilia	empty bottle of butane on porch, witnessed drinking Robitussin®	previous use illicit drug use
16	13	M	W	Propane	Yes	Pulmonary edema, congestion, intraalveolar hemorrhage	outbuilding with propane tank	none
17	20	M	NA	Butane	No	Cardiomegaly, pulmonary edema, diffuse petechial hemorrhage of brain cortex, GI and peripancreatic hemorrhage	found on ground near butane tank, towel loosely covering head	none
18	27	M	W	Butane	No	Pulmonary congestion, edema	found on floor, plastic bag on head, canister of butane in hand	none
19	12	M	W	Gasoline	No	Not performed	found in church bathroom, spilled gas can	none

with the victim for several minutes, he suddenly became unresponsive, developed clonic movements of the upper and lower extremities, and could not be revived. Examination of the vehicle revealed an empty can of Renuzit® air freshener, a plastic bag, and a towel saturated with air freshener. Autopsy showed pulmonary congestion, edema, and intraalveolar hemorrhage. The victim's blood had elevated levels of propane and isobutane.

4) A 15-year-old young man (Case 7) had a history of gasoline sniffing. Although reportedly a good swimmer, he was found drowned in the shallow end of the family's backyard swimming pool. There was a gasoline can on the patio of the house next to the swimming pool. Autopsy showed pulmonary edema, congestion, and evidence of aspirated gastric contents. Benzene, butane, toluene, and a significant amount of ethanol were present in the stomach and blood. Hydrocarbon residues were identified on the decedent's clothes.

5) The friends of a 17-year-old young man (Case 15) with a past history of illicit drug and solvent abuse saw him drink a full bottle of Robitussin® and a mouthful of Dimetapp® elixir on the porch of his family's house. He collapsed and could not be revived despite resuscitation attempts. There was an empty can of butane on the porch. Autopsy showed pulmonary edema, congestion, hemorrhage, and focal myofiber eosinophilia. There were detectable blood levels of dextromethorphan, guaifenesin, and butane.

6) A 13-year-old young man (Case 16) and his cousin were "camping out" in an electrified shed on his uncle's property. The cousin admitted that he and the decedent took turns inhaling propane from a 20-pound propane tank in the shed. Immediately after inhaling, the victim collapsed onto a pile of wood. Autopsy revealed pulmonary edema, congestion, and intraalveolar hemorrhage. Propane was detected in a blood sample.

7) A 12-year-old boy (Case 19) with a history of gasoline "huffing" left church service; 30-40 minutes later he was found unresponsive in a semi-kneeling position in the church basement bathroom. The spilled contents of a can containing a gas-oil mixture for a two-cycle power engine was found adjacent to the body and there was a strong odor of gasoline in the air. Cardiopulmonary resuscitation was begun. At a local hospital, a head CT scan was consistent with severe anoxic brain injury. Hospital personnel noted gasoline skin burns. No autopsy was performed because the medical examiner was not informed prior to burial.

Discussion

Investigation at the scene of death provides important clues to implicate solvent abuse as the cause of death in many young, otherwise healthy victims who have no history of abusing solvents. Discarded solvent containers, aerosol cans, soaked rags, and plastic bags point to a solvent-inhalation death. On-the-scene investigation allows toxicologic analysis of tissues and fluids to be narrowed to the suspected solvents and their metabolites.

Some 7%-12% of mid-teenagers in the United States have abused volatile substances at least once.[2] Solvent inhalation is a well-established cause of death,[2,4] most commonly (in 51% of cases) from direct toxic effects: respiratory depression, anoxia, vagal stimulation, and cardiac arrhythmias.[2-5] After inhalation of volatile substances, the heart becomes sensitized to catecholamines, and stress or exercise may precipitate an arrhythmia in humans[2,4] and in animals.[6] Preexisting heart disease increases the risk of fatal arrhythmia after inhalation. In addition to rhythm disturbances, chlorinated hydrocarbons are thought to cause myocardial injury and congestive cardiomyopathy. Two of our patients (Cases 8 and 17) had cardiomegaly, consistent with chronic use of solvents, but only one had a known history of solvent inhalation and drug abuse.

> "Investigation at the scene of death provides important clues to implicate solvent abuse as the cause of death in many young, otherwise healthy victims who have no history of abusing solvents."

Death is caused by asphyxia (in 21% of cases) when the plastic bag used to concentrate and inhale the drug occludes the mouth and nose after the victim loses consciousness.[5] In rare cases, asphyxia is caused by laryngeal edema due to an allergic or direct toxic effect of the solvent. Aspiration of gastric contents (in 18% of cases) can also cause death.[5] We found evidence of aspiration in two cases but this may have been an agonal, not the lethal event. Aspirated liquid solvent can rapidly chill the larynx and cause death via vagally mediated bradycardia and cardiac arrest.[2] Trauma (including traffic accidents, drowning, or falling from heights) is the cause of death in 11% of cases of fatal solvent inhalation.[5] Some abusers experience dangerous delusions such as believing that they have the ability to fly or swim.[2]

In cases that are not immediately fatal, patients may develop nausea, vomiting, flushing, sneezing, increased salivation and abdominal pain after inhaling volatile solvents.[1,2] Pulmonary edema and hypoxia of the brain, heart, liver, kidneys, and gastrointestinal tract (see Case 17) can lead to a variety of symptoms.[7,8] Aspirated butane is directly toxic to the respiratory system, producing hemorrhagic pulmonary edema, atelectasis, interstitial inflammation, necrosis of the pulmonary tissue, bronchopneumonia, and hyaline membrane formation.[9-11] Swallowed butane can cause ulcers of the upper gastrointestinal tract and hemorrhagic gastritis.[2,12]

Chronic solvent users may be identified by the smell of solvent in hair, breath, or clothing, or by finding empty solvent or aerosol cans. Perioral eczema ("glue sniffers' rash") from contact with glue during sniffing is seen in less than 1% of sniffers.[2] Careful inspection of the scene of severe or fatal inhalation is important. Every effort should be made to determine if and what type of solvent was inhaled by search for empty solvent containers, discarded glue tubes, aerosol spray cans, drug-soaked rags or clothes, plastic bags, and gasoline cans.

If volatile substance abuse is suggested by scene investigation and medical history, blood should be collected in a glass container with a metal foil-lined cap for analysis by head space chromatography. The container should be as full as possible and opened only at the time of analysis. Small containers should be used for small samples to minimize empty space in the container. Blood should be anticoagulated and stored at -5° to 4° C. In fatal cases, tissue samples, especially brain, subcutaneous fat, lung, liver, and kidney should be collected and stored similarly.[13] One report found that four of six subjects had detectable of halon or butane up to 10 hours following exposure. None tested more than 10 hours after exposure showed detectable substance.[14]

Most fatal cases of volatile substance inhalation in North Carolina involve young white men. More than half of the victims had no history of drug abuse, and since there are no specific pathologic lesions associated with volatile inhalation deaths, the scene investigation can be crucial in determining the cause and manner of death. Careful investigation and toxicological analysis of appropriate tissue and blood samples will help us better understand the scope and seriousness of this seemingly preventable cause of death in young people. ❑

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Mirror, Mirror on the Wall

What Will Medicine Be Like in 10 Years?

William M. Satterwhite III, JD, MD

Mirror, mirror on the wall,
Will you be my crystal ball?
Show me my physicians' heaven.
Show me the year 2007!

From 1987 to 1997 the world of health care underwent rapid and extensive change. A new vocabulary emerged—words like "capitation" and "primary care carve-outs." Acronyms—HMO, PPO, IPA, DRG, RBRV—proliferated to such an extent that only the military could rival the numbers.

Who could have predicted the changes that already have occurred? Who can predict the changes yet to come during the next 10 years? Only a fool will try; only a mystic will succeed. Without aspiring to be either, I shall attempt to paint a picture of health care in the year 2007. But first, two important caveats: 1) I shall try to identify trends without making value judgments about them. 2) I believe that these trends are real, but remember, change rarely proceeds in a linear fashion.

The Organization of Health Care Delivery

The cost of services. During the next decade health care costs will continue to rise. This means that cost containment will continue to be the driving force of change. Large corporations that provide health benefits to current and retired employees will feel cost escalation the most. They will aggressively pursue cost containment in order to minimize any competitive disadvantage in the global marketplace. To illustrate, Chrysler Corporation reported in 1996 that health care benefits for employees added $700 to the price of each automobile.[1] General Motors allocates $1200 of each car it produces to health care for active and retired employees, $700 more than it spends on a car's steel.[1] The private marketplace will try (with limited success) to "rein in" these costs.

There are many reasons for this seemingly incessant inflation of medical costs, but I will mention two: 1) When it comes to health care decisions, consumers do not use the same "rational," cost-benefit thought processes that they use to purchase typical consumer items like cars, televisions, and VCRs.[2] 2) Technological innovations will continue to raise the cost of health care because new diagnostic or surgical machines are more costly than the devices they replace, or if relatively inexpensive, the new machines find widespread use (for example, the pulse-oximeter). Please note that patients' decision-making processes and the costs of new technology will stimulate expenditures whether the health care delivery system is fee-for-service, managed care, or single payer, and whether there is universal coverage or only partial insurance coverage for a population. Even the British system is currently grappling with reforms instituted to control costs.[3]

Although the cost of services will continue to rise, the United States will not adopt a single-payer system in the next decade. The insurance industry is too powerful to permit this. Physicians, too, will oppose it, though it may look more attractive to them 10 years from now. It is considered "un-American" to limit the marketplace or an individual's freedom "to choose." Our society has elevated the notion of choice to an inalienable right, even in such non-Constitutional matters as the "right" to choose a doctor or the "right" to choose a school. Americans shudder at the thought of limitations on the doctors they can see or of "queuing-up" for health care services as in Britain. We prefer to have health care rationed by price, not by availability. Consequently, we will see a continued piecemeal approach to health care as exemplified by the Kennedy-Kassebaum Bill, which focused primarily on extending and guaranteeing coverage for those who already have health insurance.[4]

Consolidation. Ten more years of cost-control and competition

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will lead delivery systems to consolidate. The trend has already begun and will be ubiquitous by the year 2007. We will have horizontal consolidation of physician groups, of practice management companies, of HMOs and insurers, and of hospitals. We will see vertical consolidation beyond the current hospital-primary care networks currently in existence. In 10 years primary care physicians, specialists, subspecialists, hospitals, nursing homes, and HMO/insurers will be united under one corporate roof. Regional health care providers will operate almost like "mini-single payer systems" in their marketplaces. Brand-name health care will be common across the nation. HealthSouth, a 12-year-old company headquartered in Birmingham, AL, and run by its founder, Richard Scrushy (a onetime gas-station attendant, respiratory therapist, and country-and-western singer) has already accomplished this feat by owning a chain of rehabilitation and surgery centers in all 50 states.[5]

Consolidation will create many efficiencies beneficial to patient care. For example, every patient in a consolidated network will have a "health care passport," a card that, when run through scanners attached to computer terminals in each examination room, will give a physician access the patient's single computerized medical record. These large consolidated delivery systems will provide patients with a long list of doctors from which to choose, thereby maintaining a semblance of the "freedom of choice" that Americans expect.

Hospitalists. As part of the drive to create greater efficiency and provide a consistent quality care, there will be an increase in the number of hospital-based physicians, known as "hospitalists." Hospitalists are physicians who are employed by hospitals, large physician groups, and consolidated networks to care for patients admitted to the hospital. They work only in the hospital and have no outpatient practice. Roughly 1200 to 1500 hospitalists practice throughout the country today.[6] Hospitalists will reduce costly hospital stays since they are on the scene all day, able to check test results, and can make immediate treatment decisions, including quicker discharges. Consequently, other physicians, freed from daily hospital rounds, can increase the volume of patients they see in the office.

Clinical decision-making. Costs can only be contained by limiting what doctors do to and for patients. This will mean even tighter controls on the tests physicians can order, the medicines they can prescribe, and the procedures they can do. All restrictions and "practice guidelines" will be driven by the need to contain costs. Corporate rules will govern physician practices the way that employers' work rules govern employees. Physicians who see patients from multiple networks will have multiple accountabilities, even more than today. Since the availability of services cannot be controlled on a national level, it will be done on the micro level within consolidated networks.

Quality of services. The need to control costs will continue as the primary force for change over the next 10 years, but quality of services will eventually become an equally if not more important factor in health care delivery. One needs only to look at the automotive industry. In the 1970s, Americans purchased Japanese cars because they were less expensive and got better gas mileage than American cars. Twenty-five years later, Americans still purchase large numbers of Japanese-made automobiles. Now they are more expensive but of a higher quality than their American counterparts. People will pay more for proven quality. The same will hold true in health care: purchasers will pay more for proven quality.

An increased use of computers will allow the tracking and compiling of all health care services rendered. With the push of a button practice managers will know how many tests were ordered on 75-year-old white females suspected of having pneumonia, which antibiotics were prescribed and by whom, how many days were spent in the hospital, and how many return office visits were required. Information like this will be available on all patients within a consolidated network. Each network will use the data to "demonstrate" how much healthier patients are in their network and why paying a little extra each month is well worth it overall.

Each delivery network will be able to judge the quality of services rendered by individual physicians. "Quality control" and "utilization review" will become distressingly familiar to individual physicians not now accustomed to such strict scrutiny. Physicians with "poor" performance records will be required to remediate, while those with "good records" will be rewarded financially. Patients will benefit because clearly substandard practitioners will be identified.

These measures of quality already exist in a nascent form. HEDIS is a widely used software package that measures performance levels of different health care plans.[7] New York and Pennsylvania currently publish physician-specific data.[8] The Connecticut-based Oxford Health Plan will provide "quality report cards" that will enhance consumers' provider selection of participating specialists.[9] By the year 2007, such report cards will be the norm. Data will be available on any physician within a network or who provides publicly financed services. Even smaller physician groups now can purchase software—at a price tag of $25,000 to $50,000—that measures their outcomes.[10] In the future, physicians will be judged by how they perform medically *and* financially.

Physician Supply

We will still have an oversupply of physicians in the year 2007 for several reasons. First, we already have an oversupply. Reducing the number of students and residents will take four to eight years to have an effect. Second, technological advances will decrease the number of physicians we need. Third, a proliferation of physician assistants, nurse practitioners, and nurse anesthetists will provide services previously provided by physicians. If quality control data indicate that nonphysician providers render quality care in a cost-effective manner, their numbers will mushroom. But even if they give lower-quality service than physicians, their numbers will continue to proliferate (because of their lower salaries), just more slowly and with greater day-to-day physician oversight. Finally, reducing physician supply will be difficult because no one really knows the optimal number of physicians needed by a given population.[11]

Determining the ideal ratio of specialists to generalists will also be difficult. The apparent excess of specialists in the US compared to Great Britain, Germany, or Canada may be necessary because we do not have a centrally-controlled delivery system. More worrisome is the absolute excess of *both* specialists and generalists according to the benchmark numbers for physicians per 100,000 patients used by HMOs.[11] Some downward adjustment in the current 2:1 ratio of specialists to generalists will occur during the next 10 years. More importantly, however, surviving specialists will become much more price-competitive. Specialists will try to show that even if initially more costly, they are cost-effective in the long-run because they diagnose and treat serious conditions more quickly.

Indeed, the premise of increased cost-effectiveness is the reason why some HMOs have begun allowing enrollees to see specialists without first contacting their primary care providers. Such "open access" models already exist in New Hampshire, Minnesota, and California.[12,13] In 10 years we will have direct access to specialists whose fees for similar services will be comparable to generalists'. Direct access to dermatologists and ophthalmologists will be standard because patients know when they have eye and skin problems.

Advances in computer systems make it possible to envision a consolidated network that will be paid a set fee based on a patient's diagnosis, regardless of the tests done or treatments rendered, much like Medicare DRGs now. Specialists might fare better in such a diagnosis-related billing system because their expertise may allow quicker diagnosis and treatment of complicated patients.

Technological Changes

By the year 2007, technological change will have the greatest effect on the daily practice of medicine. Signs of this are already evident. HMOs in California, Minnesota, Massachusetts, and Georgia are using telephone triage systems staffed by nurses running computer programs to decrease unnecessary emergency room visits.[14,15] Nurses question callers as they work through computer algorithms for 550 common ailments. On average, only 2% of callers are sent to an emergency room. In 10 years, the widespread use of such telephone triage systems will markedly decrease the need for emergency room physicians.

This same type of computer program will be used not only by HMO clerks to authorize tests and treatments, but also by doctors themselves. By the year 2007, hand-held computers will contain diagnostic algorithms, textbooks, and MedLine access. Orders for tests on the patient will be entered via these computers and a fully integrated, paperless computer record system will replace current charts. These hand-held computers also will provide algorithms on billing, tests, and procedures approved by HMOs so physicians can know immediately what services will be approved for payment. These devices already are being developed by one HMO, Capp Care, Inc., of Newport, Ca.[16]

Other diagnostic technology will reduce the need for a physician to physically touch patients. Already it is possible to measure human vital signs without touching the patient[17] or to make three-dimensional images of the body using ordinary x-ray systems and special computer software.[18] Like telephone triage systems, telemedicine will reduce the need for certain types of physicians. Two-way telemedicine has already been shown to be medically effective by reducing the need for (and cost of) emergency doctors in small rural hospitals in North Carolina[19] and Minnesota.[20] Telemedicine will begin with radiology, dermatology, and pathology, but gradually other specialties will be added. Overall, fewer doctors will see more patients and cover more hospitals; the number of physicians needed per 100,000 persons will continue to decline.

In the future, hospitals will track inventories—like Wal-Mart—with tiny, bar-coded stickers on every drug packet, bandage, and syringe. Nurses will use scanning "wands" to record products used in each patient's room and in operating rooms. Scanned supplies will be reordered instantly from suppliers via computer. Hospitals will know exactly how many supplies were used for each patient or for each procedure and by which physician. Sound impossible? St. Alexius Medical Center in Bismarck, N.D., already is doing many of these things![21]

Do not be surprised if 10 years from now patients can access health care software triage systems from their personal computers at home or work. They will work their own way through the algorithm questions and schedule their own appointments. When patients arrive at the check-in area of the doctor's office, they will swipe their health care cards through a scanner, sit in comfortable chairs to have their vital signs assessed, and any imaging deemed necessary by the computer algorithm will be done. If an infection is diagnosed, an appropriate [parenteral] antibiotic will be chosen. If no treatment is needed, the patient will be told to go home. If surgery is indicated or if the patient demands to be seen by a provider, a PA will review the patient's medical record and recent tests on a hand-held computer. If necessary or if the patient insists, he or she will be seen by an MD (perhaps at a cost penalty to the patient).

Malpractice Reform

The next 10 years will finally produce long-overdue reforms in the nation's tort system. Most likely there will be limits on noneconomic damages such as pain and suffering, or there will be a workers' compensation-like system. Reform will occur for two main reasons: 1) Procedures ordered out of fear of a malpractice suit (defensive medicine) and actual claims and damages awarded increase the overall cost of health care. One way to decrease costs is to limit malpractice claims. Large employers will support legislative limits as a means of controlling costs. 2) Insurance companies and HMOs will join with physicians in the push for tort reform. In the near future, health care plans will lose their current exemption from state law torts under ERISA. Because HMOs and insurers in effect deny care when they refuse to pay for treatments, they will increasingly be held liable for malpractice and negligence. As damage claims against insurance companies and HMOs increase, they will support tort reform. Once the insurance lobby supports tort reform, even the trial lawyers will not be able to stop it!

Medicare

The rising cost of Medicare will plague America well into the 21st century. It will be politically impossible to end Medicare completely, but working people will revolt if they are asked to pay for baby boomers' Medicare outright. Consequently, Medicare will be continued through a combination of government borrowing, decreased benefits, restrictions on who qualifies, and limits on the availability of services. Participants will pay larger premiums and copayments.

The Uninsured

Fewer of our citizens will be uninsured by 2007. Medicaid and other government-financed programs will be broadened to cover many who are currently excluded. More children will be covered. The increased coverage will be financed by specific taxes, such as on alcohol and tobacco, and by general revenue funds. However, because Americans will not commit to universal coverage, many people will remain uninsured.

Conclusions

The US health care system in the year 2007 will be a blend of privately and publicly financed services and facilities. In an effort to control costs, the availability of some services will be limited. Most care will be delivered by consolidated networks providing comprehensive care for the insured. Most physicians will be employees of those networks. Clinical decisions will be made according to guidelines stored in hand-held computers. Consolidation, technological advances, and nonphysician practitioners will decrease the number of physicians needed. Doctors will get paid less than they do now. Patients will be seen and touched by physicians less often than now.

In spite of all these changes, patients will still want kind, compassionate, and knowledgable physicians. Patients will still be people. Hopefully, doctors will be, too. What will medicine be like in the year 2007? Ask a fool or a mystic. ❑

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An AHEC Internal Medicine Training Program that Continues to Produce and Retain Primary Care Internists for North Carolina

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In 1972, the North Carolina Area Health Education Center (AHEC) program initiated internal medicine training programs in community hospitals as a strategy to fulfill one of its fundamental goals: "[To] enhance recruitment, retention, and distribution of health care providers and support personnel with attention given to the needs of the rural areas." The idea was that a community training experience would prompt trainees to practice as generalists in environments similar to that in which they received their training.

We have been interested for some time in the career decisions made by graduates of the AHEC internal medicine training program at New Hanover Regional Medical Center in Wilmington. In 1986, we found that 65% of our graduates entered practice in North Carolina, 83% of whom practiced primary care internal medicine and 46% in smaller towns.[1] We concluded at that time that the goals of AHEC were being met.

A number of events during the past 10 years have affected the career decisions of internists: a need for more primary care practitioners,[2] an increase in the number of providers, changes in remuneration patterns, and the advent of managed care. All of these influence the career decisions of budding internists. We therefore undertook another review of career choices to determine whether the practice choices of our residents have changed.

Materials and Methods

We reviewed the career decisions, and geographic preference and distribution of the 97 physicians who graduated from the Internal Medicine Residency program at New Hanover Regional Medical Center between 1976 and 1997. We excluded residents who only did a preliminary year in our program before going on to noninternal medicine subspecialties ("preliminary track").

Results

Overall there were 97 graduates, 75 (77%) of whom chose careers in primary care internal medicine; between 1976-1982, 19 of 23 graduates (83%) chose primary care, and between 1983-1997, 56 of 74 (76%) did. Those percentages are not statistically different.

Of the 75 graduates who selected primary care internal medicine practice, 45 (60%) stayed in North Carolina, 5% went to South Carolina, and 35% to other states. Nearly half (48%) of those settling in North Carolina chose towns with populations less than 20,000; 35% chose small cities of 20-100,000 people; and only 16% chose large cities (over 100,000 population). Figure 1, next page, shows that many primary care practitioner graduates settled near Wilmington, but there was a wide geographical dispersal. Most of the graduates who pursued subspecialty fellowship training moved out of state, and only 20% returned to North Carolina.

The percentage of trainees who were International Medical Graduates (IMGs) increased significantly ($p<0.03$ by chi-square test) from 26% in 1976-1982 to 42% during 1983-1997. Table 1 shows the career decisions of American Medical Graduates (AMGs) and IMGs. The percentages of AMGs choosing primary care during the two time periods are not statistically

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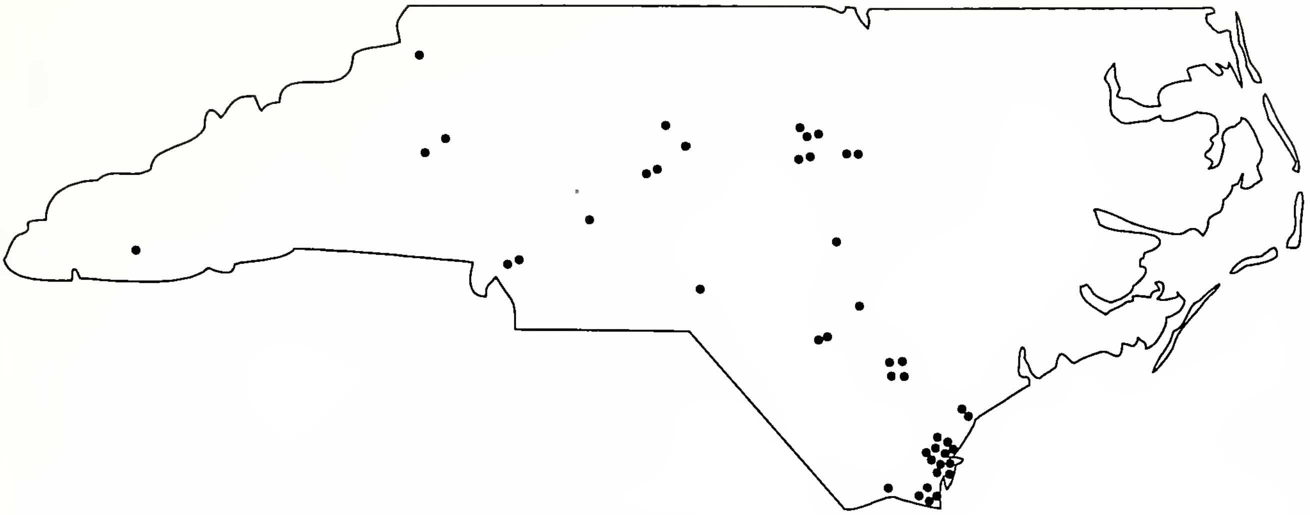

Fig 1: Distribution of graduates practicing primary care in North Carolina

different, nor are the percentages of IMGs choosing primary care during the two time periods. However, compared to AMGs, a significantly smaller percentage of IMGs chose primary care during the 1983-1997 time period (p<.001 by chi-square test).

Table 1. Number of graduates selecting primary care/total number of graduates

	1976-1982	1983-1997	1973-1997
American graduates	15/17 (88%)	40/43 (93%)	55/60 (92%)
International graduates	4/6 (67%)	16/31 (52%)	20/37 (54%)

Discussion

Nationally, about 60% of the graduates of internal medicine residency programs enter subspecialty training.[3] Graduates of our program have been much less likely to subspecialize, and this trend continues despite an increase in the number of IMGs in our house staff.

AMGs in our program go into primary care at a high rate (>90%), and the percentage of IMGs entering primary care (55%) is higher than the national average. The retention of primary care practitioners in North Carolina was unchanged over the studied periods, as was the tendency to settle in smaller towns.

The National Study of Internal Medicine Manpower found[4] that a lower proportion of residents entered general internal medicine when subspecialty training programs coexisted in the hospital, when there was a preliminary track, and when there was a larger percentage of IMGs in the program. Our program does not have subspecialty training, but it does have a preliminary track and had an increased percentage of IMGs during the last period of analysis. Despite this, we have continued to produce a high percentage of primary care internists who tend to remain in North Carolina. An important contention of the AHEC program is that training people in high-quality community hospitals, away from the university but with strong academic affiliation, induces trainees to settle in areas of the state that have inadequate numbers of physicians. Our experience confirms this. ❑

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“Amwayfaring” Doctors

Mark Swaim, MD, PhD

> I am a poor, wayfaring stranger,
> While journ’ying through this world of woe...
> —*Bever’s Christian Songster, 1858*

In one large Amway branch in south Florida, a tenth of the sales force is made up of physicians. So says a recent front-page story in the *Wall Street Journal*, reporting on a growing doctor contingent among Amway salespeople all around the US.[1]

I cannot think of a simple assumption (that these doctors are just burned out; that they are greedy) to sufficiently explain this phenomenon. Indeed, Occam’s Razor seems to me completely disposable in attempting to account for what lures physicians with lucrative medical practices into peddling, on the side, detergents and household cleaners.

Nor is it easy to explain what piques me about Amway-selling doctors. “I don’t know what I think,” said novelist E.M. Forster, “until I write it down.” Miners once toted canaries deep into mineshafts; if the birds fell dead, the miners had early warning of lethal, odorless gases and poor air. I guess that my miner’s canary keeled over when I learned that members of my profession were turning, in record numbers, to pyramid-scheme salesmanship in search of fulfillment.

Is it all about money? Questing after lucre is not intrinsically unethical. Dr. Samuel Johnson wryly said that there are few ways in which one can be more innocently employed than in getting money. Most doctors who see managed care lop 20% off their income will not be impoverished, but can hardly be faulted for being spurred to paroxysms of industriousness. Of course, the average Amway distributor’s business brings in only $88 per month, but the effort is suffused with hope. Amway has, after all, made millionaires of a few.

But I believe that money is a decoy etiology, a too-easy explanation that lures like a will-o’-the-wisp away from deeper consideration of the discontents that lead doctors to sell Amway products. Wonder Woman tossed a magic lasso around villains to make them to tell the truth, but I doubt that even she could get these doctors to articulate a clear sentiment for their actions. They aren’t villains, either. I think they are responding to a subtle shift in their perception of doctoring. Even though amply remunerated and competent as healers, they are no longer gratified by their work.

Ben Bradlee of *The Washington Post* said that in youth we strive for the approval of others, but that in maturity we become gratified by a sense of effectiveness in our lives. Perhaps the doctor/salesman has lost the sense of clinical effectiveness because the era of managed-care subordinates what is best for the patient to what is best for the corporation. When the essence of practice becomes reduced to dollars, then dollars perniciously define doctors’ view of their life and work. “Just so it is between the shepherd’s dog and the wolf,” wrote William Morris, the 19th-century English craftsman. “Their respective views on the subject of mutton differ only in degree.”

Salesmanship has a single blunt point; put a mathematician’s absolute-value brackets around it and you’ll always come up with a dollar sign. The bottom line is at once cause and effect. Dr. Johnson might have regarded the pursuit of money as a pure form of employment, but even if true, doctoring somehow isn’t about being employed. Doctoring is a profession, not a job, and the profession of doctoring is—or ought to be—a way of life. Turn our focus on money and the clinical muse vanishes from the examining room.

Will Durant, the noted historian, said that all great nations begin stoic and end epicurean. Ditto, I believe, for great professions. They originate in selfless higher purpose and degenerate into selfishness—pride transmogrified into its Janus-twin, shame. Doctors whose sense of professionalism is not encumbered by moonlighting as Amway distributors are, I fear, on the road to perdition—and the rest of the profession with them, tailgating a system that has forced doctors to dollar-denominate their professional activity. ❑

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Not My Husband's Shoes

A Lesson in Empathy

Margaret N. Harker, MD

One day not too long ago, I was walking through the emergency room on my way to my office. In a few short minutes I learned a lesson about empathy.

> *Empathy: the mental entering into the feeling or spirit of another person; appreciative perception or understanding; the placing of oneself in another's shoes.*

Empathy is a quality often called for in the practice of medicine. It is something we physicians are supposed to just "have." I thought I was pretty well endowed with the virtue until that day.

Think of all the times we have to give bad news to good people. We probably all do this somewhat differently, and there are books and courses to help. Just how we actually do it depends a lot on how our mentors did, but even more on our own life experiences and our approach to life in general.

In my 54 years, I have had only two really "bad things" happen to me. The first was when I miscarried in the first year of my marriage and then conceived no more. I think I now provide special help for patients in similar circumstances. The second was when my father gradually lost his mental capacities and sustained two strokes and heart failure. Now I have a deeper understanding for patients and caregivers struggling with stroke, Alzheimer's disease, and daily life under those circumstances.

"Just how we actually (give bad news to good people).depends a lot on how our mentors did, but even more on our own life experiences and our approach to life in general."

That day in the ER, I heard over the two-way radio that the rescue squad was bringing in a boat captain "in full arrest." I stood stock still, frozen with fear. My husband is a boat captain and was out that day. The stretcher rolled in, surrounded by emergency personnel, and was quickly swallowed by the ER staff. Was this my husband? Who of our many boat captain friends was it? No one knew his name or the name of his boat. I was verging on a full-blown panic attack when I saw the man's shoes. Not my husband's shoes! Then I had the courage to peek and look at the man's face. No one I knew, but he was *someone's* family. He was being well tended to, and I had work to do. I left.

Still Too Close to Home

My office is just across the street from the hospital. I barely made it there before I "lost it." I cried and cried and couldn't stop. Fortunately, my husband has a cellular telephone on the boat; before I could compose myself I had to talk to him (discreetly, since those wonderful gadgets are not private). I was greatly relieved to hear his voice; he was greatly puzzled. After a cup of coffee and some hugs from my staff, I was able to get on with the work of my day.

Later, reflecting on the event, I recalled those times when families of my patients "lost it" over "bad news." I recalled with remorse and guilt feelings that these emotional scenes had seemed somehow a little annoying. I regretted that I hadn't heretofore had a more complete empathy with them.

Since the day I didn't see my husband's shoes, I think I have been a better, more empathic physician. I have wondered whether we can't acquire empathy in easier ways. How would one teach feelings? Sometimes, when we are taught how to act in such circumstances, I think we are being taught acting, not feeling. I would like to know my colleagues' experiences and thoughts about empathy. Is this something we could share? Would it make us better doctors? ❑

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On Retirement

“Better to Burn Out than Rust Out”

Jesse P. Chapman, Jr., MD

I completed my training at the Mayo Clinic in October 1948, and moved to North Carolina. The furthest thing from my mind was retirement. My early years of active practice were filled with efforts to provide for my growing family, buy a comfortable home in a respectable neighborhood, and acquire those material things my wife, Frances, and I had done without during nine years of medical school, training, and military service.

Insurance agents called regularly at my office offering programs that would provide for my family in the event of my premature death (I was then 30 years old), and also accumulate funds for my retirement. Social Security had become law in 1935, but physicians in private practice (and other professionals) were excluded from participation. Somewhere along the line, Individual Retirement Accounts became available, but the investments Frances and I could make were small, to say the least. In 1969, the IRS determined that professional associations, when approved by the state in which they were located, had the same status as corporations. My partner and I were among the first in western North Carolina to incorporate, making possible many fringe benefits, but especially retirement plans for all our employees.

In 1983, I celebrated my 65th birthday healthy and vigorous, and enjoying a busy surgical practice with two younger colleagues. A few years later, after some unpleasant hours with bronchial asthma, it seemed unwise (if not impossible) to continue practice at the pace I was going. “Tapering off” was not a viable option.

Fortunately, one of our financial advisors had suggested that, in anticipation of retirement, Frances and I determine the absolute minimum income we would need at that time. For two years we tried to live within that limited income. Then I rather precipitously announced in late November my intention to retire December 31st. Through a misunderstanding of Social Security regulations, the checks on which we had counted did not begin coming until the first of February. When I called the local office, I was told that payments to me had been put on “hold” because I was still an officer of a corporation. It took a meeting of the directors of our corporation and a copy of the minutes to clearly show I was retired from all relationship to the corporation before Social Security began to pay—fortunately, they went all the way back to my retirement date and made up the previously frozen payments. It took Frances and me six months to get over the constant worry of whether we could expect a reasonable income from all our sources of income.

Slowing Down But Not Stopping

I kept my state medical license, although I never planned to see patients or write prescriptions. Many years ago, when the Division of Vocational Rehabilitation recruited district medical consultants, I was invited to participate—and I have been part of the program ever since. My job consists of translating for the counselors the medical terms in doctors’ reports, giving brief lectures on medical topics of interest to the staff, and occasionally calling a referring physician to clarify some item in his or her report—especially new treatments or procedures.

I was fortunate to have been involved in the creation of Mountain Area Hospice during my active professional years; since retirement I have served on the board of directors, the Hospice Foundation’s board, and also been part of an “in-house” committee to audit patients’ charts for accuracy and completeness.

Shortly after I moved to Asheville, I was invited to join the local Rotary club. With the encouragement and help of my medical colleagues, I was later able to serve as club president and as district governor. Since retirement, I have attended Rotary regularly, serving on local and district committees.

Church has always had a significant place in our family life. We have been regular, active church participants except during the years of my internship and residency, when the demands of training precluded routine involvement. Retirement has done little to change my involvement in church life:

Dr. Chapman is a retired cardiothoracic surgeon residing in Asheville.

I teach a Sunday school class of adults and am a life deacon. Because of my church affiliation, I have served as chair of the board of trustees of a large hospital and a theological seminary.

Several years ago, a friend asked me to serve on the board of directors of a local nonprofit cemetery. Since then I have become a member of the executive troika of that board, responsible for week-to-week operations and filling in when the manager is ill or on vacation.

I became interested in computers when our medical group bought one for our practice in the early 1970s. Just for fun, I learned how to write programs in BASIC, although I was never masochistic enough to learn more sophisticated programming languages. The computer is useful as a word processor, and I have written about two-thirds of my autobiography with one. My computer also helps me maintain a family genealogy database containing more than 5,000 individual records. I also keep a list of the vocations in our county for the Rotary club Classifications Committee. I am now trying to "computerize" the cemetery's records of 10,000 graves. I also "keep the books" for a small corporation owned by our family as well as for the cemetery. I have avoided the Internet because I need a little time to work in the yard and watch television after my 20-minute daily ritual on the treadmill.

All this activity is important for my well-being. Someone once told me: "I would rather burn out than rust out"—that's an excellent philosophy for a retired doctor. ❑

FIRST-PERSON PHYSICIAN

Absolution

Diagnosing Sleep Apnea in a Family Member

E. Wesley Ely, MD, MPH

I do not usually attend my patient's sleep studies, but this was different: I had blatantly missed the diagnosis! Sitting in a chair next to his bed, I was struck by how much time he actually spent without breathing. Electrodes and thermistors passed information from his troubled body to the computers and monitors in the next room. I was learning the details of what my heart already knew. I could see the 60-second periods of apnea traced onto the computer screen. His arterial oxygen saturation plunged from a high of 90% to a nadir of 42%, meaning that less than half of his blood had oxygen traveling with it. How was this patient (who happened to be my brother-in-law) capable of any meaningful existence under these circumstances? How much had he suffered because of my oversight?

I should have made the diagnosis years ago. After all, I am a pulmonologist, well versed in the vagaries of severe sleep apnea. Having given grand rounds and read extensively on sleep-related breathing disorders in Down's syndrome, you would think that I could have recognized an overt "case." But this patient was my brother-in-law, and I had been blind to his affliction.

Greg is 30 years old and he has Down's syndrome. He stands 5 feet tall and is a robust 145 pounds. He is a courageous child encased in an adult's body and plagued by the limitations imposed by Down's syndrome. The striking thing is that he does not realize the gravity of his own impediments. Consequently, he is always cheerful and upbeat, a phenomenon common to most people with Down's. Over the years, without our recognizing that his protuberant belly could contribute to any medical problems, most of the gifts we gave to Greg were food! One of the most moving images that I have ever seen is his innocent smile, beaming from ear to ear, when he eats an ice cream cone.

Recently, though, the glimmer in his eyes had faded. He still smiled, but he seemed tired. The family noticed the change in his energy level. In the mornings and at work bussing tables, he was in a stupor. Once he had told stories and asked questions with surprising alacrity, but he no longer engaged in conversations easily. When my mother-in-law asked about this, I told her that perhaps it was the natural development of his personality. In truth I had wondered if perhaps he was developing the accelerated Alzheimer's disease that can accompany Down's syndrome. But I did not want to cause her concern, so I chose

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not to tell her of my fears. In retrospect, my passivity as a physician and family member permitted his well-being to deteriorate. "Poor Greg," I thought, "is just not doing well these days," and I took my observations no further.

Over a recent holiday visit, I watched Greg plunge into sleep after a full dinner. His snoring, which the family had joked about for years, began almost immediately. Then rhythmically, his breathing would start and stop, start and stop. I saw his belly and chest chasing each other in paradoxical motion. Apnea episodes that were initially 10 to 15 seconds long soon extended into what seemed like an eternity. With each failed attempt to breathe, my heart sank. My mind seemed to be working in slow motion. I finally realized that he had sleep apnea.

I had always wanted to shelter Greg from any harm, but in so doing I let emotion hinder my diagnostic abilities. Now, in a moment of epiphany, I put aside the layperson's paternal frame of mind to don the white coat and stethoscope of the physician that I was. What distressed me most was that I regularly and easily diagnose sleep apnea in much less obviously affected patients. But here in my own house, in someone very dear to me, I had missed an obvious reason for decline. Once I assumed the role of doctor, I was annoyed with myself and my pride was hurt. As his guardian and brother-in-law, I felt guilty for "allowing" his disease to progress to this degree.

Determined not to confound further the roles of brother and physician, I called a colleague to tell him of my discovery and to ask him to supervise Greg's evaluation and therapy. The following evening he underwent a polysomnogram in our hospital's sleep lab; I insisted on staying with him for the study. Through all of this, I carried a burden of guilt that I am still not sure was fully justified. On this occasion, however, I tried not to give in to my powerful ability to rationalize a situation for my own comfort. Speaking more like a father than a physician pursuing a diagnosis, I tried to explain to Greg why so many electrodes and wires had to be connected to his scalp and torso.

> "Once I assumed the role of doctor, I was annoyed with myself and my pride was hurt. As (Greg's) brother-in-law, I felt guilty for 'allowing' his disease to progress to this degree."

The magnitude of Greg's sleep apnea was profound. He woke more than 100 times per hour because he could not breathe. As a consequence, he never fell deeply asleep for any length of time. As the night wore on, he experienced cardiac arrhythmias and severe hypoxemia. Watching his unrestful sleep, my role was clearly not that of a doctor who specializes in pulmonary medicine. I left that "hat" at home. I was a terrified brother who could see the now uncertain future my once radiant brother-in-law faced. Would this disease, coupled with Down's syndrome, further shorten his lifespan? How would he tolerate therapy? Could he lose weight? Could he understand that we were not trying to punish him, that it was not his fault?

Next to Greg's blissful demeanor, his greatest virtue is trust. His immense faith in me (as brother, not doctor) allowed him to adapt to use of a continuous positive airway pressure (CPAP) mask at night. Poor compliance with CPAP is a notorious problem for most patients with sleep apnea, but Greg wears the mask throughout the night simply because we have asked him to. The first evening at home, I put him gently to bed and coaxed him to remain calm while I stressed how the machine would make him "better." I placed the mask and straps around his face and head. Silently, I prayed that he could comprehend the necessity. I hoped that things had not progressed too far, that CPAP would not only improve his health, but (selfishly) would relieve my guilt and sense of incompetence. Happily, CPAP has given him a new lease on life. The family says he has not been this alert in years. With the haze of perpetual exhaustion lifted, I see him once again chasing and playing games with my daughters.

Our Roles in Retrospect

Physicians wisely resist the temptation to take care of members of their own family. Maybe this is my excuse for not diagnosing Greg's life-threatening sleep apnea sooner. All of us have loved ones who inevitably fall prey to illness. When we also try to play the role of doctor, we on occasion stumble with diagnoses (as I did). I think it is probably a good idea to either be at work and thinking like a doctor or "off duty" altogether, abiding by the ancient rule of "*primum non nocere.*" Is it prudent to put on our doctor's "hat" so casually that we discount or miss potentially hazardous diagnoses in friends or family? Probably not! My vision was blurred by being too close, so I was blinded to the signs of Greg's disease. Emotional attachment is only human, but it interfered with my decision-making. Balance is probably the key to the dilemma. I am pleased that I could serve as Greg's doctor, but I am more thankful to be his brother. Of course, Greg's remarkable recovery and his tolerance of the CPAP mask have made me feel better about my skills as a physician. And as always, I have learned more from the patient than the patient has from me.

I guess that all doctors miss diagnoses over their lifetime. I suspect that all of us feel bad about those inadequacies, and seek peace of mind in some manner. For me, this came from the clinical success of establishing a diagnosis and an appropriate treatment for Greg, no matter how belatedly. Sometimes doctors need overt forgiveness from the patient in order to expiate blame, but Greg cannot perceive that there is anything for which to grant forgiveness. So I have been absolved by my wife, my in-laws, and most importantly, by myself. The restoration of Greg's personality as a paragon of hope and joy for others affects all who cross his path. I am pleased to say that I was able to contribute in rekindling Greg's radiance by being both his brother and his [former] doctor. ❑

A Symphony of Service

James Evans Davis, MD 1918-1997

by John Glasson, MD

His firm handshake and "It's nice to see ya" were known to thousands throughout our state and nation. James E. Davis, dedicated surgeon and statesman, offered a lifetime of service to our Durham community, to the "City of Medicine," to our state and nation. Jim was also my close friend and medical colleague, both during our years of residency at the Cornell Medical Center and in our private practices for 50 years. He served as general surgeon for my entire family. On one occasion he personally took me to the hospital in the middle of the night to receive care from another surgeon. I appreciated his valuable help in getting me through the emergency room routine—just one of the ways that Jim demonstrated his friendship to me through action. Throughout his life, Jim demonstrated his devotion to his family and friends, his patients, his community, and his profession with a "symphony of service." Dr. Davis died suddenly and unexpectedly on October 27, 1997, while seeing patients at the Durham Regional Hospital.

Building Bridges

Jim Davis was born in Goldsboro, NC, on March 2, 1918. He exhibited early leadership when he organized a stamp club in junior high school. He went on to receive an AB degree in 1940 from the University of North Carolina at Chapel Hill. There he was president of the student council and captain of the track team (he set a Southern Conference record for the indoor mile which remained unbroken for many years). Jim maintained a lifetime association with his alma mater, serving as president of the General and Medical Alumni Associations of the University of North Carolina and received Distinguished Service Awards from both organizations. In honor of his many accomplishments, UNC awarded him an honorary doctorate of science.

After leaving Carolina, Dr. Davis enrolled at the University of Pennsylvania Medical School where he earned his MD in 1943. I first met Jim in 1944 when we interned together at the Cornell-New York Hospital. He completed a full seven-year residency, serving as chief resident and instructor in General Surgery in 1951. Following our training at Cornell, Jim and I both returned to Durham to set up our surgical practices in 1952, but Jim's early years were interrupted by tours overseas with the US Navy and the US Marine Corps.

In 1954, Jim became chair of the Department of Surgery at Watts Hospital (later, Durham Regional Hospital), holding the combined posts for 25 years. He was very influential in bringing about the successful 1968 bond issue that led to construction of Durham Regional Hospital in 1976.

In a series of informal meetings with Dr. Charles Watts of the Lincoln Hospital and Dr. William Anlyan of Duke, Dr. Davis was most reassuring that African-American physicians in the Durham community would be admitted to all privileges at Durham Regional Hospital. He actively supported the creation of the Lincoln Community Health Center, spearheaded by Dr. Watts, as an outpatient facility located on the grounds of the former Lincoln Hospital. Jim was a keystone to the creative, peaceful solution of a potentially divisive and volatile issue in the Durham Community.

Jim's medical and civic leadership began in his local community but reached out to influence regional and national medical issues. He served as president of the Durham-Orange County Medical Society and the North Carolina Medical Society (1976). He is the only physician to have served as president of the Greater Durham Chamber of Commerce. In 1988, the Greater Durham Chamber of Commerce presented Dr. Davis with its highest honor, the Durham Civic Honor Award.

Jim brought fame and honor to the city of Durham by founding the City of Medicine program in 1981 to increase awareness of the growing reputation of the medical and health care industry and its positive impact on the local economy. Under his leadership, the program established the annual City of Medicine Awards to recognize national and international medical scientists and other leaders in medicine who have made

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Dr. Glasson is Immediate Past Chair, AMA Council on Ethical and Judicial Affairs, and retired orthopedic surgeon, Durham major contributions in medicine and health care in the public interest.

Just this year, Dr. Davis had completed six years as a trustee of Durham Regional Hospital. He was a strong supporter for the proposed alliance between Duke Medical Center and Durham Regional Hospital. His work with the medical staffs of both institutions will receive much credit if the plan is successful. Most recently, the hospital and its medical staff established the "James E. Davis Leadership Service Award" and honored Dr. Davis as the first recipient.

Dr. Davis became a recognized leader of North Carolina medicine. The first State Institute of Medicine was chartered by the North Carolina General Assembly largely due to his efforts. He chaired its Board for many years. In addition, he served as president of the North Carolina Surgical Association, president of the NC Chapter of the American College of Surgeons, and president of the North Carolina Division of the American Cancer Society. He was a member of the Board of Trustees of Blue Cross and Blue Shield of North Carolina for 25 years and served as chair of the State Health Coordinating Council.

Jim was the kind of person who got involved and made a difference in people's lives. He was consistent in his efforts to take an active role in decisions that affected the quality of care that physicians can deliver to patients. For example, when professional liability insurance became unavailable to North Carolina physicians, Dr. Davis rendered distinguished service to all his colleague-practitioners by founding and leading one of the nation's first physician-owned insurance companies, the Medical Mutual Insurance Company of North Carolina.

Jim was able to see the critical aspects of complex situations and brought clarity of thinking to the table of debate. He was instrumental in getting Good Samaritan laws passed by the North Carolina legislature. These laws enable retired physicians to give voluntary service in free clinics without needing full professional liability insurance coverage. Jim made major contributions to cost-containment in surgical care on a local and national level by leading the organization of the Durham Ambulatory Surgical Center and by authoring a text (*Major Ambulatory Surgery*) in 1986.

Jim made significant contributions to the national medical community. He was a leader of North Carolina support for *Research!America*, a national program which has assumed major importance in a time of decreasing federal support for medical research. He served as governor of the American College of Surgeons and was the founding president of the American Society of General Surgeons. He served as chair of General Surgery for the Pan-American Medical Association. And in 1988, Dr. Davis became the only North Carolina physician ever to assume the presidency of the American Medical Association. Drawing on the experience of a distinguished career as vice speaker and speaker of the American Medical Association, he served his profession and the public further by writing *Davis' Rules of Order* (1992), currently the official parliamentary authority for the American Medical Association and for most state medical associations.

James E. Davis, MD. Photo courtesy of City of Medicine program.

A Legacy of Leadership

Jim had a good way with people. It was his lifelong habit to extend a prompt "thank you" by personal note or phone call to all who worked with him in his many activities. As speaker of the American Medical Association, he had an uncanny ability to identify and support the "will of the assembly." He presided as speaker with fairness, equanimity, and above all, a pervasive and sometimes disarming sense of humor. On many occasions he engaged in delightful banter with colleagues from the northern states on the qualities of "gourmet grits" or the peculiarities of his "language of the South."

I fondly remember answering the phone to hear his familiar voice saying, "John, this is your obedient servant, Jim Davis." Sometimes he was calling to propose a role for me in one of his numerous projects, but most often it was to offer a ride to a meeting of the Institute of Medicine or the Joint Conference Committee on Medical Care. We particularly enjoyed these times to talk, sometimes about our own lives, sometimes about the affairs of government or medicine.

Dr. Davis made major commitments to service in a number of areas beyond those required by his practice of general and thoracic surgery. He became president or chief executive of some 30 medically related organizations. In spite of his many outside commitments, and even during his year as AMA president, this dedicated surgeon continued to serve his private patients both in his office and in the hospital. Office records indicate that he had seen in excess of 30,000 patients during his career. In his 1988 inaugural address as AMA president, Dr. Davis quoted one of his elderly patients as saying, "Dr. Davis, I'm glad you're going to lead the AMA. You'll travel the country. You'll travel the world. But always let your office know where you are, for there may be something I'll want to ask you." Without a doubt, he gladly complied with her request.

In recent years, as a licensed lay minister of the Episcopal Church, Dr. Davis visited fellow church members in hospitals and nursing homes. He provided much comfort and support in this role, not as a physician, but as a minister of the Gospel of Christ.

His final address as president of the AMA, delivered to the House of Delegates in June 1989, was titled "A Symphony of Service to American Medicine." In it Dr. Davis envisioned the American Medical Association as the maestro of a symphony orchestra. The nation's diverse groups of physicians, representing the many instruments in the orchestra, could only provide the American people with a harmonious "symphony of service in medicine" under AMA leadership. In honor of Dr. Davis, the AMA established a continuing national award to honor physicians who have heeded Dr. Davis' call for physicians to "tithe" of their time in service to their communities.

Jim was a true leader, from beginning to end. Fellow trustees on the Durham Regional Hospital Board recall his insistence that the presiding chair could not, according to best parliamentary practice, personally adjourn the meeting. Consistent with Jim's desire for full participation and proper closure, he usually provided the last words by saying, "Mr. Chairman, I move that we adjourn immediately."

As I review the life of Dr. James E. Davis, I see that he himself was the conductor of a "Symphony of Service"—to medicine and, in broad service, to Americans in many capacities outside the medical profession. We whose lives he touched directly will greatly miss him, as will all those others who benefited from the good that he did in his remarkable career.

Dr. Davis is survived by his wife of 53 years, Margaret Royall Davis; two sons, Kenneth Royall Davis of Chapel Hill and George Harrison Davis of Athens, Ga.; and one sister, Martha Harrison Davis Schofield of Chapel Hill. Dr. Davis was predeceased by a son, James E. Davis, Jr., who died in 1980. ❑

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Psoas Abscess

Diagnosed if Suspected

Gerardo M. Maradiaga, MD, Mario G. Fiorilli, MD, MPH, FACPM, FACP, William G. Elmore, MD, and John Hunt, MSIV

Abscess of the psoas muscle is not common—as few as 12 cases are reported per year in the United States.[1] Untreated, the mortality rate approaches 100%, usually because of septicemia, but timely diagnosis and appropriate treatment drops mortality to about 2% for primary and 9% for secondary abscesses. Diagnosis is often delayed because the symptoms are not specific, and a high index of suspicion is necessary to make the diagnosis. We review some of the features of psoas abscess.

Our Patient

A 72-year-old woman underwent release of a stenotic left carpal tunnel. Antibiotic prophylaxis was used, and there was no evidence of infection immediately after the procedure. Two weeks later she complained of weakness, fever, shortness of breath, and low back pain radiating to the right leg. She was admitted to a hospital where the white blood cell count was 12.9 (normal 4.6-10.2) Differential count showed 83% neutrophils. Routine laboratory tests, including urinalysis, were normal. Blood cultures from two separate sites were positive for *Staphylococcus aureus*, reported as sensitive to methicillin. She was given intravenous cefazolin for 10 days and discharged on cephalexin by mouth for another week.

Eight days after discharge, she again developed persistent, severe low back pain and fatigue, and was seen for the first time by us. On admission to our hospital, medical history revealed only remote cholecystectomy, appendectomy, and exploratory laparotomy for pelvic abscess. She reported allergy to penicillin. There was no history of back trauma and no previous complaints of back pain. On examination she appeared chronically ill, but was not febrile and her blood pressure was normal. Her skin was dry and had decreased turgor. There were no heart murmurs and her lungs were clear to auscultation. She was tender at the right costovertebral angle, and flexion of the right hip elicited pain in the right quadriceps muscle. There was no cyanosis, clubbing, or edema. Rectal exam was unremarkable; stool was negative for occult blood.

White blood cell count was 10.4 (74% neutrophils), hemoglobin was 10.8 gm/dL, Westergren sedimentation rate was 91 mm/hr (normal 0-20). Radiograph of the lumbosacral spine showed narrowing of the L4-L5 space. An echocardiogram was normal and showed no valvular vegetations.

After blood was sent for bacterial culture, she was started on intravenous vancomycin. A computed tomogram (CT) of the right psoas muscle showed a low-density lesion measuring 3.5 cm in diameter (Figure 1, next page) with surrounding ring enhancement, consistent with an abscess. Culture of material obtained after CT-guided needle aspiration grew methicillin-resistant *S. aureus*, as did the blood cultures drawn on admission. Under CT guidance, a pigtail catheter was inserted into the abscess cavity; it was removed 72 hours later, after complete radiographical resolution of the abscess.

The patient was given 1.2 gm of vancomycin every 48 hours, and Rifampin (600 mg/day) was added on day 3. She improved, but continued to complain of low back pain. Magnetic resonance imaging of the lumbar spine demonstrated increased signal at the L4-L5 intervertebral disk, compatible with bacterial infection of the disk. She was referred elsewhere for L4-L5 diskectomy and debridement of the epidural space. After surgery, she wore a therapeutic brace, and continued vancomycin. Currently she is off antibiotics and analgesics, and is doing well.

Discussion

Only a handful of cases of psoas abscess are reported each year in the US. Primary abscesses (those with no obvious source of infection) are presumed to arise from hematogenous spread.[2]

Drs. Maradiaga, Fiorilli, and Elmore are affiliated with Halifax Memorial Hospital, Roanoke Rapids: Dr. Maradiaga is Chief, Internal Medicine; Dr. Fiorilli is with Infectious Diseases, and Dr. Elmore is with the Radiology Department. Mr. Hunt is a fourth-year medical student at University of North Carolina School of Medicine, Chapel Hill.

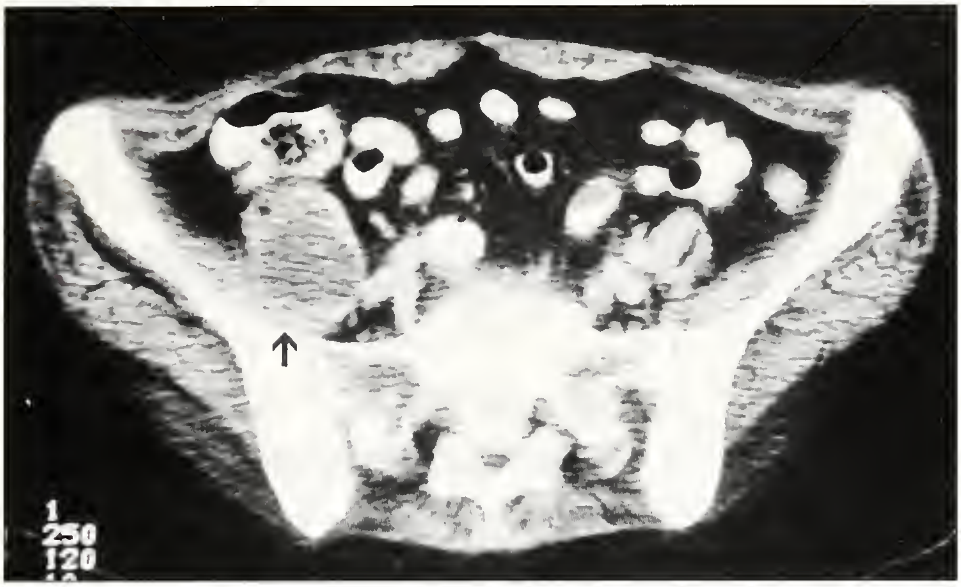

Fig 1: Contrast-enhanced CT image depicts a low-density lesion in the right psoas muscle (at arrow), indicating psoas abscess.

Secondary abscesses spread directly from contiguous structures. There is marked geographic variation in rates of primary versus secondary abscesses, which may reflect variations in the thoroughness of investigation. In Ricci's retrospective study,[3] 90 of 328 cases were called secondary. Secondary abscesses have a higher mortality rate than primary (18.9% vs 2.5%).

In the early 1960s, *Mycobacterium tuberculosis* of the spine was the most common cause of secondary psoas abscess. Lately this position has been taken by abscesses arising as a complication of Crohn's disease (60% of cases),[4] but secondary abscess can result from extensions of infection from the renal pelvis, ureter, appendix, ileum, spine, jejunum, and sigmoid colon. Vertebral disc infection (as in our patient) and osteomyelitis accounted for 10% of cases in one study. The causative bacteria found in psoas abscesses include *Staphylococcus aureus* (88%), *Streptococcus* (5%), and *Escherichia coli* (3%).[3] Methicillin-resistant *S. aureus* is a major cause of nosocomial infections.

The most common signs and symptoms of psoas abscess in 67 patients were: abdominal pain (73%), hip pain (59%), temperature greater than 38° Celsius (61%), chills (40%), abdominal mass (37%), and weight loss (34%).[5] The onset may be insidious, which delays recognition. The psoas muscle originates in the low thoracic and lumbar vertebrae and inserts on the lesser trochanger of the femur; this anatomy give rise to the *psoas sign* (the patient prefers to lie supine with knee flexed and the hip slightly rotated). *Cope's test* refers to the elicitation of pain when, with the patient reclining in a decubitus position, the contralateral thigh is forcibly extended.[6] The induction or relief of pain by leg position is thought to be related to the traction on nerves in the area of the abscess. Pain can be generated with either contraction or extension of the psoas muscle.[7]

In our patient, the signs of psoas abscess were present when she was admitted to our institution. They may have been present from the start, but were erroneously ascribed to "back strain." We did find a positive Cope's test and a positive iliopsoas test. We believe that our patient developed bacteremia at the time of the original surgery. This led to diskitis, and subsequently, formation of the psoas abscess.

No laboratory findings are specific for psoas abscess.[8] Elevated sedimentation rate, leukocytosis, and anemia (as in our patient) accompany a number of inflammatory or infectious disorders. Imaging studies are the best way to establish the diagnosis. Plain radiographs may show elevation of the diaphragm and pleural effusion, or the shape of the psoas shadow may be altered. Ultrasonography or computed tomography are the best ways to identify psoas abscess. Ultrasound is cost-effective and identifies about 80% of the cases. If is widely available and can differentiate solid from fluid-filled structures (phlegmon vs abscess). CT can show smaller lesions and give precise localization, but there are no specific features that permit CT distinction of psoas abscess from neoplasm or hematoma.[9] Gruenwald[3] claims that CT and ultrasound, together, can detect 95%-100% of psoas abscesses.[10] No ultrasound was performed on our patient, but CT showed location and extent of the lesion, and gave an easy way to follow the patient's progress.

Treatment must include intravenous antibiotics appropriate to the causative organism. Empiric therapy against *S. aureus* should be used until the organism and its antibiotic sensitivity are identified. Opinions differ about the need for open surgical drainage. One study of 11 patients in 1995 showed that surgery significantly reduced average hospital stay (from 28.5 to 15.9 days). On the other hand, CT-guided aspiration of the abscess avoids the risk of an open surgical procedure.[10] In 1991, a study of eight patients showed no difference in outcome and no recurrence with either approach.[11] In our patient, percutaneous drainage and intravenous vancomycin worked well, although diskitis prolonged the need for antibiotics.

Psoas abscess is a potentially fatal but curable disease. It can be diagnosed if one remains alert to the possibility and looks for appropriate signs and symptoms. The diagnosis should be considered in all patients with abdominal, pelvic, or hip pain, and the triad of limp, pain, and fever should provoke an active investigation. Treatment with appropriate antibiotics and abscess drainage can be lifesaving if implemented on time. ☐

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Carolina Physician's Bookshelf

The History of the Pathology and Surgery Departments at the University of North Carolina School of Medicine

Gustavo S. Montana, MD, Professor, Dept. of Radiation Oncology, Duke University Medical Center, Durham

Author's note: Documenting the history of an academic medical center is desirable, important, and difficult. Knowing history helps us to avoid our previous mistakes. Not knowing history prevents us from knowing what mistakes we have made. To write history, it is necessary either to have witnessed events or have access to records and documents. It is most desirable to record first-person accounts of events. Dr. Stuart Bondurant, former dean of the UNC School of Medicine, considered it important to document the development of the clinical departments created when the school was expanded from a two-year basic sciences program to a four-year school in the 1950s. Two historical monographs have been published. Other departments are preparing accounts.

UNC medical school's transformation into a four-year program occurred during a pivotal time in the US. It was a time of growth and expansion yet also a time of fewer regulations and constraints. It is not possible to analyze and compare the accomplishments of individuals outside the contexts of time and setting, yet it is indeed remarkable that in a short time period—and despite numerous limitations—the departments of Pathology and Surgery achieved such prominence and contributed greatly to the school. I review here two recent books that describe and document contributions made by two departments and the people responsible for them.

How It Was: Pathology at UNC 1896-1973
by John B. Graham, MD

Library of Congress Catalog #96-60784, 1996, hardcover $35, paperback $25. Book available from the UNC Department of Pathology and Laboratory Medicine (919/966-4677), CB# 7525, Chapel Hill 27599-7525

How It Was: Pathology at UNC was written by Dr. Graham, who was a member of the Pathology Department and a significant contributor to its success. The book primarily describes the period when Dr. Kenneth Brinkhous was chair and the department gained prominence.

Graham recounts significant dates in the history of the department, such as in 1921, when the state legislature blocked efforts to build a four-year medical school in Chapel Hill because the "teaching of evolution" had been rendered illegal by the Poole Bill. It is interesting to note that, during this time, a joint four-year medical school was being considered by Trinity College and UNC. Basic sciences would be taught at UNC and clinical sciences at Duke. Members of Baptist and Methodist organizations blocked this venture because they believed it would violate the separation of church and state. UNC had a four-year school earlier, from 1901 to 1909, with basic sciences taught in Chapel Hill and clinical sciences in Raleigh. The clinical sciences program was discontinued after the Flexner Report on Medical Education.

Graham describes the dynamics of the Pathology Department and how Brinkhous attracted young, talented individuals to its ranks. Graham recounts lively "turf battles" familiar to medical academicians. One notable battle involved the control of the department's laboratories, which were ultimately given to the hospital.

As department chair, Brinkhous established a productive and successful research program in coagulation. He already had been interested in this field and was an established investigator before coming to Chapel Hill. Graham himself was very involved with the coagulation research early in his career but subsequently became interested in genetics. Graham was instrumental in developing UNC's population center.

The Pathology Department's record is enviable in every respect. The department has contributed enormously to the teaching and training of medical students, residents, and technologists. It also has played a pivotal role in developing collaborative research efforts with other departments.

Graham's book places the formation of the department within the context of the medical school's growth. He also discusses the foundation, development, and funding of the dental and public health schools.

As a former UNC faculty member, I was happy to review this book since I had the pleasure of working with some of the prominent figures mentioned within its pages. ❑

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Legends and Legacies—A Look Inside: Four Decades of Surgery at the University of North Carolina at Chapel Hill 1952-1997

by Mary Jane Kagarise, RN, MSPH, and Colin G. Thomas, Jr., MD

ISBN 0-9653036-0-8, 1997, $65. Book is available from the
UNC Department of Surgery, (919/966-4052), CB# 7058, Chapel Hill, 27599

Legends and Legacies describes the development of the Department of Surgery at UNC-Chapel Hill under the leadership of Dr. Nathan Womack and his successor, Dr. Colin Thomas. This text documents the department's history and features reminiscences from those who contributed to its development and success. The text is nicely illustrated with vintage photographs of Chapel Hill, the train station in Carrboro, the hospital surroundings, and prominent individuals involved with the medical school and the university.

The book begins at a significant point in UNC history. In 1952, UNC's School of Medicine went from a two-year basic sciences school to a full-fledged, four-year school. Part 1 of the book describes the early development of the Department of Surgery and the recruitment of Dr. Nathan Womack, the department's first chair. Part 2 describes the structure of the department and the development of its different subspecialties under Dr. Womack and his successor, Dr. Thomas. Over the years, the subspecialties grew and established training programs of their own. They still function as integral segments of the department.

The authors point out notable programs that have developed within the department, such as transplant and trauma services established under the leadership of Drs. Stanley Mandell and the late Herbert Proctor. The Department of Surgery has also been involved with the Area Health Education Centers (AHEC) program since its inception. AHEC was created to share medical expertise with communities across the state. It also enlarged the base of clinical experience for medical students and residents when the legislature mandated that the medical school enlarge its enrollment.

The book recounts the development of the department's renowned sports medicine program, in part stimulated by the tragic death of a university athlete from heat stroke. The department also supported the creation of UNC Hospitals' Burn Center, known for its pioneering work on cultured skin allografts. Some of the initial funding for the center was given by John Stackhouse, an electrical contractor who had two workers severely burned on the job and treated at UNC. Contributions from volunteer firefighting organizations and the public also helped fund the center.

The book notes the importance of UNC's surgical oncology program developed by the late Dr. James Newsome, a faculty member until his untimely death in 1989. Dr. Newsome also played an essential role in the development of UNC's Comprehensive Cancer Center.

Numerous "reflections" peppered throughout the book are sincere and deeply felt testimonials to the department and its members. The text describes a successful department; one committed to educating medical students and residents, and to setting exemplary standards for patient care and research. In reading this book, I discovered details about an institution and a department that I am familiar with, but now have learned to appreciate and value even more. ❑

Readers are welcome to suggest books for review consideration. Contact *Journal* book review editor Edward C. Halperin, MD, at Box 3085 DUMC, Durham 27710, 919/660-2115, fax: 919/684-3953, *e-mail:* halpe001@mc.duke.edu

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❑

CME Calendar

February 20
Dermatology for the Non-Dermatologist
Place: Hawthorne Inn, Winston-Salem
Credit: 7 hours Category 1, AMA
Fee: physicians: $110, PAs: $90, residents: $60, students: $30
Info: Office of Continuing Education, Wake Forest University School of Medicine, Medical Center Blvd., Winston-Salem 27157, 910/716-4450 or 800/277-7654

February 20-22
Authorship in Biomedical Publication: Problems and Proposals
Place: Berkeley Marina Marriott, Berkeley, CA
Fee: workshop: $165, retreat: $295, both: $395
Info: Council of Biology Editors, 847/480-9080, fax: 847/480-9282, *e-mail:* cbehdqts@aol.com

February 27-28
Annual Geriatrics Symposium
Place: J. Paul Stitcht Center, Wake Forest University School of Medicine
Info: Office of CME, 910/716-4450 or 800/277-7654

March 1-4
National Comprehensive Cancer Network Conference: Practice Guidelines and Outcomes Data in Oncology
Place: Marriott Harbor Beach Hotel, Fort Lauderdale, FL
Info: NCCN Conference, c/o PRR, 516/424-8900, ext. 300

March 9-12
Postgraduate Course in Head and Neck Anatomy
Place: VCU School of Medicine, Richmond, VA
Credit: 44 hours, Academy of General Dentistry
Info: Hugo R. Seibel, PhD, Dept. of Anatomy, P.O. Box 980709, VCU School of Medicine, Richmond, VA 23298-0709, 804/828-9623

March 12
Clinical Neuro-Ophthalmology Review
Place: UNC School of Medicine, Chapel Hill
Info: Christine C. Cotton, UNC Dept. of Ophthalmology, CB# 7040, 617 Burnett-Womack Bldg., Chapel Hill 27599, 919/966-5296

March 20-22
Clinical Decisions in Urogynecology
Place: Crowne Plaza Manhattan, NYC
Credit: 10.5 hours Category 1, AMA
Fee: physicians: $495, physicians-in-training & allied health professionals: $295
Info: Center for Bio-Medical Communications, Inc., 201/385-8080, fax: 201/385-5650

March 20-22
Management of the HIV-Infected Patient: A Practical Approach for the Primary Care Practitioner
Place: Crowne Plaza Manhattan, NYC
Credit: 20 hours Category 1, AMA
Fee: physicians: $495, physicians-in-training & allied health professionals: $295
Info: Center for Bio-Medical Communications, Inc., 201/385-8080, fax: 201/385-5650

March 27-29
Clinical Infectious Disease: A Management Review for the Practicing Physician
Place: The Plaza Hotel, NYC
Credit: 18.75 Category 1, AMA
Fee: physicians: $545, physicians-in-training & allied health professionals: $400
Info: Center for Bio-Medical Communications, Inc., 201/385-8080, fax: 201/385-5650

March 27-29
Type 2 Diabetes Conference
Place: The Buttes Resort, Tempe, AZ
Info: presented by the American Diabetes Association and the National Institute of Diabetes and Digestive Kidney Disease; fax request for info to: 602/861-0542

April 15-18
NCMS Spring Conference and Leadership Symposium
Place: Embassy Suites Hotel, Research Triangle Park
Info: Dana R. Hammermeister, NCMS, 800/722-1350 or 919/833-3836, *Internet:* http://www.ncmedsoc.org

April 22-26
Crtical Care Medicine: 12th Annual Review and Update
Place: Crystal Gateway Marriott, Washington, DC
Credit: 39.25 hours Category 1, AMA
Fee: physicians: $795, physicians-in-training & allied health professionals: $575
Info: Center for Bio-Medical Communications, Inc., 201/385-8080, fax: 201/385-5650

April 29-May 2
International Conference on Physician Health
Place: Victoria, British Columbia, Canada
Info: sponsored by AMA and Canadian Medical Association, contact Elaine Tejcek, Project Manager, 312/464-5073, fax: 312/464-5841, *e-mail:* elaine_tejcek@ama-assn.org

May 1-5
Council of Biology Editors' 41st Annual Meeting
Place: DoubleTree Hotel, Salt Lake City, UT
Info: Andrea Blood or Denise Baran, CBE, 847/480-9080, fax: 847/480-9282, *e-mail:* cbehdqts@aol.com

May 13-15
Carolinas HealthCare System Spring Symposium
Place: Charlotte Convention Center
Credit: up to 24 hours Category 1, AMA
Info: Mary Anne Cox or Brenda Armes, CHS/Charlotte AHEC Office of CME, 1366 E. Morehead St., Charlotte 28204, 800/562-7314, 704/355-8631, *e-mail:* www.symposium@carolinas.org, *Internet:* www.carolinas.org/symposium/

June 9-13
7th Annual Advanced Cardiovascular Interventions Symposium
Place: Westin Resort, Hilton Head, SC
Credit: up to 18 hours Category 1, AMA
Fee: $795
Info: Mary Anne Cox, CHS/Charlotte AHEC Office of CME, 1366 E. Morehead St., Charlotte 28204, 800/874-2417, 704/355-3942

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Aphorisms of the Month

Daniel J. Sexton, MD, Section Editor

"Assorted Sayings About Character and Life in General"

Character is like a tree and reputation like its shadow. The shadow is what we think of it; the tree is the real thing. —*Abraham Lincoln*

We judge ourselves by what we feel capable of doing, while others judge us by what we have already done. —*Henry Wadsworth Longfellow*

The cynic is one who never sees good quality in a man, and never fails to see a bad one. He is the human owl, vigilant in darkness, and blind to light, mousing for vermin, and never seeing noble game. —*Henry Ward Beecher*

I learned years ago not to doze off or leave my wallet lying around in the presence of people who tell me that they are more moral than others. —*Carl T. Rowan*

Familiarity may breed contempt in some areas of human behavior, but in the field of social ideas it is the touchstone of acceptability. —*Ralph Waldo Emerson*

Self-trust is the essence of heroism. —*Ralph Waldo Emerson*

The louder he talked of his honor, the faster we counted our spoons. —*Ralph Waldo Emerson*

No change of circumstances can repair a defect of character. —*Ralph Waldo Emerson*

Many foxes grow grey, but few grow good. —*Ben Franklin*

Send aphorisms to Dr. Sexton at: Box 3605, Duke University Medical Center, Durham, NC 27710.
fax: 919/684-8358, e-mail: sexto002@mc.duke.edu

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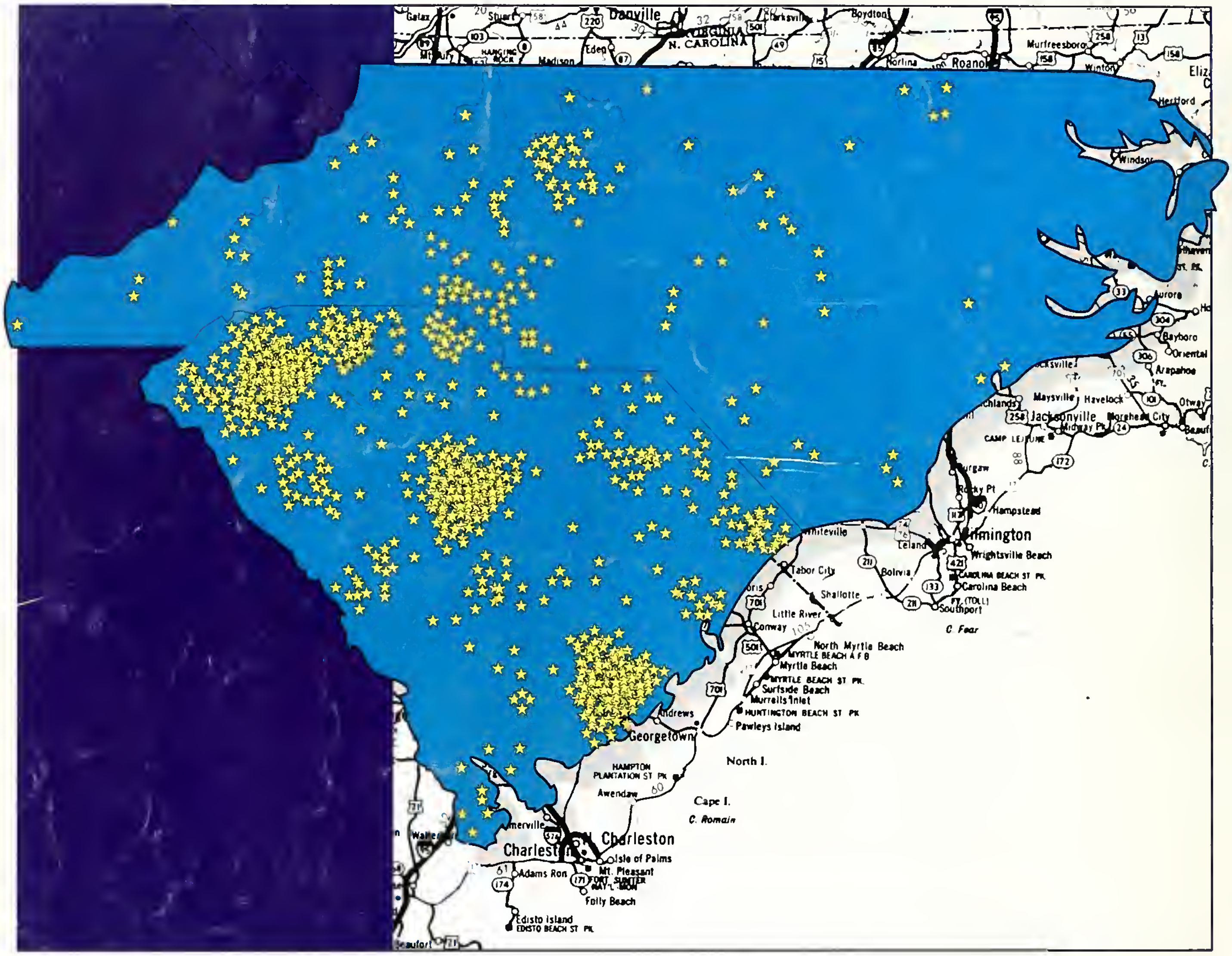

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March/April 1998
Volume 59
Number 2

North Carolina Medical Journal

PR - 1 1998

For Doctors and Their Patients

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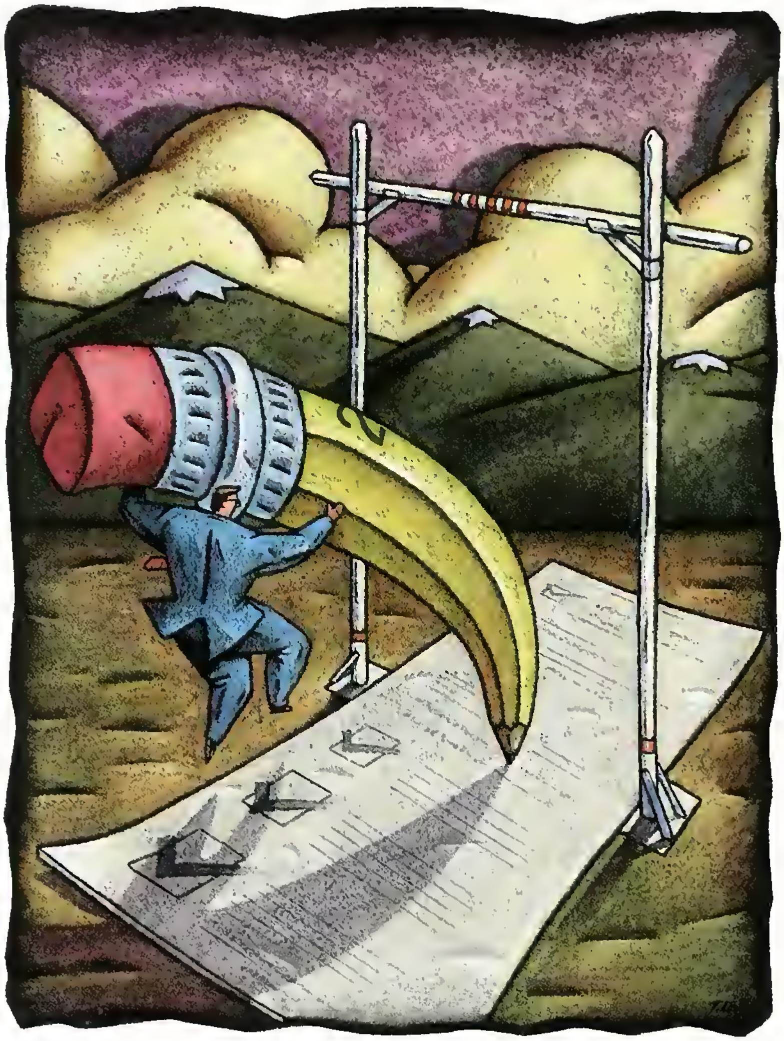

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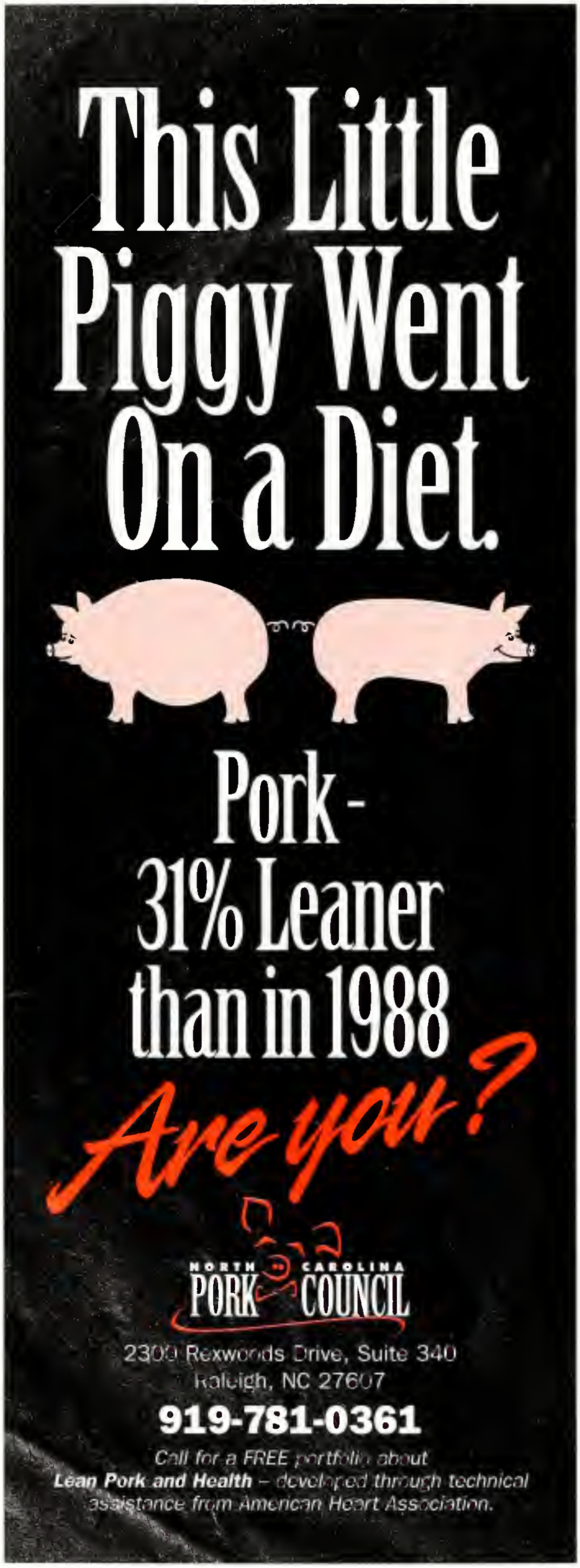
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FOR DOCTORS AND THEIR PATIENTS

March/April 1998, Volume 59, Number 2

Cover: A four-layer Profore compression boot is used to treat patients with venous stasis leg ulcers. See article, page 128. Photo CD courtesy of Smith & Nephew, Largo, FL.

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Letters to the Editor ✍

Alternative Medicine: Readers Have Their Say

Editor's note: Dr. Ed Halperin's call to abolish the NIH's Office of Alternative Medicine and accompanying commentary in the January/February *Journal* (NC Med J 1998;59:21-6) struck a chord with our readers, several of whom write below. Let's keep the dialogue going. Send letters to Box 3910 DUMC, Durham, NC 27710 or e-mail to yohn0001@mc.duke.edu

To the Editor:

It's about time we had this discussion. Let me add just a few points to Dr. Halperin's splendid opener. The central problem is that "alternative medicine" is not a field. It is a collection of completely unrelated therapies, ranging from the plausible to the preposterous. They are linked only by the desire of their proponents to be judged by a different standard than conventional or science-based medicine.

Science-based medicine is updated with every new finding. If a researcher can demonstrate to the satisfaction of other scientists that his or her results were obtained with more sensitive instruments, or more powerful methods of analysis, the textbooks are rewritten without a backward glance. By contrast, many—if not most—alternative therapies steadfastly resist change, often for centuries or even millenniums, unaffected by scientific discoveries in physiology or disease.

Dr. Sullivan argues that "what we consider to be alternative or complementary today sometimes becomes mainstream tomorrow." As an example, he cites advances in the treatment coronary heart disease using low-fat diets and exercise. Does he really believe that these advances emerged from alternative medicine? These practices are based on solid science-based research, most of it funded by NIH (none of it funded by the Office of Alternative Medicine). Remarkable advances in our understanding of physiology and extensive epidemiological studies, recorded in thousands of peer-reviewed articles published in mainstream scientific and medical journals, brought about this revolution. It is a triumph of scientific medicine.

As Dr. Cassileth suggests, there are complementary therapies that warrant our attention. Some offer promise and should be thoroughly researched; some are in desperate need of debunking. The OAM is not suited for either of these tasks. Those, of course, are the function of the existing Institutes, which already support more research in alternative medicine than the OAM.

Dr. Weil points to Wayne Jonas's meta-analysis of homeopathy as an example of a scientific study. Other researchers looking at the same data find nothing beyond statistical noise. I urge anyone who has not done so to read Dr. Jonas's book, *Healing with Homeopathy*. It is more revealing than anything that could be written by critics. I would feel more comfortable about the OAM if, in this enormous menagerie of unlikely treatments, it could find even one that does *not* work.

The OAM was not designed by scientists but by politicians—at least one politician. It is often said that the OAM was "mandated by Congress." That's an exaggeration. It was created by an earmark inserted by Senator Tom Harkin (D-Iowa; at the time, chair of the HHS Appropriations Subcommittee) into the report accompanying the fiscal year 1992 appropriations bill. The earmark provided $2 million. Five years later it's up to $20 million. The earmark represents one paragraph in a 250-page report. It was never debated. There were no hearings. Unlike an actual appropriations bill, report language is not voted on and does not have the force of law. Few members of Congress even see such reports. This tactic has been described as "appropriation by intimidation."

It is not the money that concerns me, although there are better things on which to spend our money. What the bill provides, and what it proponents were after, is a cover of credibility for unproven therapies. For the public, the very fact that a therapy is being studied by the NIH is reassuring. Most of the therapies are in themselves harmless. A homeopathic remedy, after all, contains no medicine. By keeping people from seeking unneeded antibiotics or overdosing on cold pills, something like homeopathy may even promote health among the not-very-sick-to-begin-with. The danger is that it reinforces a sort of upside-down view of how the world works, like trying to find your way around San Francisco with a map of New York City. That could be dangerous for someone who is really sick—or really lost.

Robert L. Park, PhD, Physicist
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College Park, MD

To the Editor:

I agree with Dr. Ed Halperin's recent article that declares "Let's Abolish the Office of Alternative Medicine of the National Institutes of Health." The most rational and the most likely way to ensure better understanding and acceptance of new therapies as efficacious is through established clinical trial methods, combined with what we have learned about the mind and the brain through cognitive psychology (a literature largely unknown to physicians). For example, the OAM was not necessary for large clinical trials of the efficacy of antioxidant therapy for cancer and cardiovascular disease, therapies that 20 years ago would have been virtually ignored by the medical profession. Nor was the OAM needed to study neuron sprouting (and therefore increased cognitive capacity) that occurs in an enriched social environment.

Nor do I anticipate that eliminating the OAM will decrease efforts by the NIH and academic health centers such as Duke to investigate popular yet untested therapies, although I do think that eliminating the OAM will decrease the tendency to marginalize such investigations. Solid science and open minds have served the profession of medicine for the past 150 years. Our goal should be not to segregate medicine, but to accommodate all therapies that prove useful and disabuse the public of therapies of no proven value. If we attend to this goal, the public's health will be well served by physicians.

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To the Editor:

The recent roundtable discussion on alternative medicine was very timely, but failed to bring out several significant points that I believe would support the continuation of the Office of Alternative Medicine (OAM). We are in the midst of a medical revolution prompted by economic forces, distrust of traditional medicine, and more importantly for the sake of this discussion, a virtual explosion of alternative medicine.

In 1994, President Clinton enacted the Dietary Supplement Health and Education Act, which essentially deregulated the use of "dietary supplements." This list includes vitamins, herbs, oils, enzymes, glandulars, minerals, amino acids, antioxidants, etc. Their use in alternative medicine accounts for almost 50% of activity currently monitored by the OAM (according to their website). I believe deregulation is the primary reason accounting for the explosion in alternative medicine in the past five years. As a result, the FDA can only monitor safety and truth in advertising issues, but cannot regulate their use. The effects of dietary supplements are long term, often subjective, and thereby don't lend themselves easily to peer review. Alternative medicine practitioners often refute the need of peer review since their products are "natural" and have survived the test of time. Perusal of bookstores reveals an ever-increasing list of books by "experts," most not physicians, but more like purveyors of usually anecdotal information.

In my view, alternative medicine practitioners are attempting to supplant traditional medicine and have an excellent opportunity to have a significant impact due to the ongoing medical revolution. Their efforts and arrogance in vilification of traditional medicine is simply mind-boggling. I offer as evidence a nationally syndicated radio talk program, "Here's To Your Health," with Dr. Donald Carow, a self-described "medical maverick," offered five times a week for the public's education. In a recent broadcast, he actually stated that traditional medicine knew the *cures* of various problems from cancer to cataracts, but was withholding them so as to control a billion-dollar industry. He often describes traditional cardiology as a scam with the real treatment being fatty acids, fish oils, antioxidants, and chelation therapy (which of course he'll gladly consult and arrange for you). He feels that managed care refuses to recognize alternative medicine since if it did, their financial capacities would be exhausted in trying to meet the overwhelming requests. He further states that managed care could then eventually save comparatively millions more in the long run by employing alternative rather than traditional medicine regimens.

I detest big and especially "bigger" government. But I believe the OAM could play a major role in monitoring alternative medicine and ultimately keep this explosion sensible, and believable. I agree with Dr. Mack in that "...it is about time that science gets used to prove or disprove the usefulness of this herb (St. John's wort) or any other alternative medicine regimen." I believe the OAM should be maintained but definitely restructured.

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To the Editor:

I read with interest Dr. Halperin's article on the Office of Alternative Medicine. He made some very good points, but I take exception to his conclusion, that the best course of action is to completely abolish the office.

Anyone who practices primary care medicine is continually bombarded with questions related to alternative medicine. Every day, patients ask me if I approve of medicines, procedures, and herbs that are completely foreign to me. I am beginning to wonder if my entire clinic takes St. John's wort! Why is this so? I think it reflects a general populace that has not embraced the basic tenets of a healthy lifestyle: diet, exercise, and weight maintenance; problems arise and they feel out of control. Alternative medicine such as yoga, special diets, prayer, energy field therapy, etc., reinvolves patients in their own health care, and this may, indeed, be a major component for its success.

Another reason why patients gravitate toward alternative medicine is because of our poor management of nonmalignant chronic pain. Chronic low back pain, fibromyalgia, and chronic headache patients are usually the "most feared" patients in a practice. We contract with them for the number of pain pills we will give per month, and if they call before the designated day, they risk earning the label of "drug seeker." Combine this with the common side effects of pain medication such as drowsiness, GI problems, and potential addiciton, and is it any wonder that patients seek alternative options? I have had a couple of chronic back pain patients who have had a good result with acupuncture. Was that placebo effect? If it was, I'm all for it.

Dr. Halperin's description of publicly funded experiments in homeopathic research does sound like placebo vs placebo trials. Certainly some discretion needs to be exercised in determining a reasonable rather than a foolish course. It seems, however, that this indiscriminant spending is a function of the office director, rather than the OAM, per se.

Dr. Halperin's points are well taken, but abolishing the OAM is sort of "throwing the baby out with the bath water." Perhaps a better plan would be to replace the current director with someone who is truly interested in generating useful and needed data.

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Psoas Abscess: An Uncommon Disease

To the Editor:

The January/February *Journal* certainly had a very interesting array of articles, one of which was "Psoas Abscess: Diagnosed if Suspected," by Dr. Gerardo Maradiaga, et al (NC Med J 1998;59:54-6).

It is interesting that iliopsoas abscesses are uncommon now. When I was a resident in Baltimore, we cared for patients in the two nearby tuberculosis sanitoria. These iliopsoas abscesses I saw there were universally tubercular abscesses. It was not unusual to have three or more patients with these abscesses on the orthopedic surgical service at the same time. I do not know of any patient with an iliopsoas abscess who had an infection other than tuberculosis. When I came to Raleigh in 1954, we were getting better care for tuberculosis, and iliopsoas abscesses seemed to disappear, as did other forms of osseous tuberculosis. The surgical treatment was costotransversectomy. If secondary infections did not occur, the results were good.

I'm glad that iliopsoas abscesses remain uncommon today.

Thomas B. Dameron, Jr., MD
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Hogs and Health

To the Editor:

The January/February *Journal* came at a most fortuitous time. The two articles ("Of Hogs and Men: Does North Carolina's Hog Industry Raise the Risks of Infectious Disease?" NC Med J 1998;59:12-5 and "Human Health Effects of Hog Waste," NC Med J 1998;59:16-8) about the potential health problems of intensive livestock operations (ILOs) provided an excellent overview of present and potential problems.

For the past year, I have served as chair of the Duplin County Board of Health. The Board is very concerned about the potential health impact of the hog industry in North Carolina, specifically in our county. Water quality has always been the most significant issue. Recent studies from Sampson County are reassuring, but do not resolve the issue of ground water contamination from overspill nor answer the question of potential problems in the future. Certainly flies and odor are a major concern. Citizens who have commented at multiple board meetings say that their health has been adversely affected by the proximity of ILOs. Such a correlation is medically difficult to prove and document, but it is certainly perceived.

Other concerns not addressed in your articles include increased traffic and congestion, and the medical problems of those who work at ILOs. Many are immigrant workers who suffer from tuberculosis, and there is an alarming rate of HIV infection among young Hispanics. Clearly, the growth of the industry needs careful monitoring. We commend continued efforts by the industry to reduce potential hazards. We are attempting to form a committee of representatives from the industry, the health board, and the community to jointly discuss areas of concern and hopefully resolve some issues.

One final comment regarding leptospirosis. This is an unusual and rare disease. In summer 1996, my son contracted it after attending camp in Johnston County. The camp's lake lies downhill from two large ILOs, one of which is a large hog operation. Even with the help of the Centers for Disease Control, we were never able to pinpoint the origin of his infection, which certainly may have derived from some wild or domestic animal, or the livestock operation. It was an alarming illness, one that put my son in the hospital for five days. It would behoove physicians in eastern North Carolina to remember this potential pathogen in adults and children who present with an unusual febrile illness.

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The Tenuous Coexistence of Medicine and Law

To the Editor:

What a beautiful letter Dr. Meymandi wrote to the *Journal* ("Issues to Consider When Dealing with Premature Death," NC Med J 1998;59:6).

It would be wonderful if this letter could be intellectually superimposed over the lead letters on tort reform from Drs. Pritchard and Kenan and Mr. Breeze. Dr. Meymandi outlines magnificently what it is about the practice of medicine that feeds into and is fed on by lawyers and litigation.

John R. Dykers, Jr., MD
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Paper Not Patients

To the Editor:

Recently I attended a "mandatory" meeting of the medical staff at my teaching hospital. The meeting was called to review the standards by which the Evaluation and Management (E&M) codes recently published by the Health Care Financing Administration and approved by the American Medical Association are to be implemented. It seems that my leaders are terrified that the government's announced crackdown on "fraud and abuse" in medicine will translate into fierce inspections to see that "the rules for documentation have been followed"—to be followed soon thereafter by monetary paybacks and fines levied against the medical center.

The general tone of the government's stance seems to be that we are "guilty until proven innocent," and that the clinical work done will be defined by the amount of writing exhibited by the person in whose name the bill is made (in my case, all money goes to the Department of Medicine anyway).

In listening to the visiting coding expert interpret the new guidelines, I heard something that only minimally resembled what I really did in the clinic and in the hospital. "Time" was mentioned because the elapsed time is to be recorded in cases where there is face-to-face "counseling" with the patient (that means talking, not listening, by the physician). And "time" only counts when the talk is directed to the patient, not to the family or other caregivers.

The specifics of compensation for being a supervising physician hinge on when you first saw or laid hands on the patient—one minute after midnight becomes "the next day" regardless of any prior role you may have had in arranging, ordering, or supervising the work of the staff. If you do not physically encounter the patient while making those arrangements, compensation begins on "the next day" when you do.

My attendance at the meeting ended when a colleague asked, "Suppose I arrange to admit my patient to another service, and come in to write a note (exploring code status, reason of admission, or other insights I might contribute to the patient's care)?" The coding expert answered, "Why would you do that?" At that point, I left saying, "Because he loves the patient."

Our profession has been transmogrified into a "business" characterized by antagonism, mistrust, and threats between the caregivers and those who should be responsible for seeing that the care given gets paid for. This situation has wreaked havoc on our teaching system and the biopsychosocial model of patient understanding and care. It has removed much of the joy of being a teacher (and, remember, "doctor" means "teacher"). I cannot believe that true fraud and abuse is so rampant—especially in the use of E&M codes. The enforcers who equate "care" with what is documented in the chart are completely clueless as to what proper medical care is and should be.

Fortunately, nothing in the new guidelines states that the language we use must be English. Ridicule is powerful and can be used in two directions. I suggest that we revive the classics and that doctors write once again in Latin. The current situation is ridiculous. Let's point this out to the bean counters.

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Journal Articles Are Resources for Programs

To the Editor:

I am coordinator of Continuing Pharmaceutical Education at the University of Utah College of Pharmacy. We appreciated receiving permission to photocopy the *Journal* article, "Nicotine Withdrawal Symptoms: A Review for Primary Care Practitioners" (NC Med J 1995;56:40-5) for a program we presented on January 11. One of our speakers requested the article as background material for participants. Thank you.

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University of Utah College of Pharmacy
rfitzpatrick@deans.pharm.utah.edu *via Internet*

To the Editor:

I would like permission to duplicate the following articles for participants in the 1998 NC Women's Health Summit (March 30-April 1). The articles would be part of background reading materials for approximately 80 participants. The Summit is being organized by the NC Department of Health and Human Services Division of Women's and Children's Health.

1) Williams ME, Thompson BG. Geriatric care in the 21st century. NC Med J 1996;57:369-71.
2) Gupta N, Galanos AN. Why healthy elders move to a continuing care retirement community. NC Med J 1996; 57:378-80.
3) Rankow EJ. Primary care of the gay or lesbian patient. NC Med J 1997;58:92-8.
4) Seligson RW. The shifting horizon of medical practice in North Carolina. NC Med J 1996;57:70-3.

Beth Boorman, MEd
American Social Health Association
P.O. Box 13827, Research Triangle Park, NC 27709

From the Editor: It's gratifying to know that local, as well as national health care professionals deem *Journal* articles worthy of a wider audience.

Correction: Dr. Marian Swinker points out a error in her article, "Human Health Effects of Hog Waste," in the January/February *Journal* (NC Med J 1998;59:16-8). On page 18, *Vibrio vulnificus* is the name of the bacteria, not *V. vulnificans.*

Continued

An Open Letter to North Carolina Doctors: Wall Street Mentality and Health Care—A Poison Pill?

To the Editor:

As a former physician Board member of a managed care company in North Carolina, I want to let my fellow physicians know about recent policies and performances of that company. I am confident that I speak for about 60 other physicians who at one time or another served on the Board of Directors of Central Carolina Physicians Health Plan, which became Carolina Physicians Health Plan in 1988, and then Healthsource NC in 1994. I suspect that my thoughts are shared by physicians elsewhere in the state who have had similar experiences starting physician-owned and physician-directed health maintenance organizations (HMOs), only to have them subsumed by larger entities that use little or no physician guidance.

In the early to mid-1980s at least five such companies were founded in North Carolina. Other HMOs were beginning in urban portions of the state and their methods frustrated many physicians and their patients, leading some physicians to organize companies on the premise that the best way to influence the inevitable progression of managed care was for a regionally owned, physician-directed HMO to be a "player" in the process. Furthermore, health insurance premiums were increasing at a rate of 15%-50% every year. The message from corporate America and from governmental bodies was to change the health care delivery system. Systems were developed and steps taken to rein in costs. Many of us felt that physicians could do a better job of making the health care system more efficient than could persons of other backgrounds and perspectives. The Central Carolina Physicians Board of Directors felt that we could forge a broad network of physicians in the Triangle area to enhance quality of care and simultaneously improve cost-effectiveness. We also thought that by holding down costs the progressive rise in numbers of people without health insurance could be stopped, and we would have fewer patients in our practices with no insurance at all. It was an opportunity to serve the best interests of both our profession and our patients.

There is a fundamental lesson for physician organizations in assessing how our original mission was eroded. We physicians committed too few funds to establish our company. We had a keen sense of mission and purpose, but lacked a collective willingness to provide the financial wherewithal that would realize those intentions. Because we were inadequately capitalized, we took the irreversible step of obtaining outside capital to keep our company economically alive. The economic rescue led to loss of control of policy-making.

The lessons of fiduciary pressures were soon driven home. We sold 29% of our company to gain the resources needed. Our company grew rapidly and was remarkably stronger. The quality of our service was high, and patients generally were pleased with the care provided. The Board of Directors was clear about one thing: once the company erased its start-up deficits, the portion of funds assigned to participating doctors but kept in escrow as part of risk-sharing (the "withhold") would be paid in full each year to the physicians. In fact, we intended to phase out the withhold entirely.

Our hopes were that by coupling the basic mission of quality patient care with clinically sound cost-saving the company would become successful and bring value to shareholders as well as to patients. The Wall Street mentality said otherwise. Our publicly traded holding company (Healthsource, Inc.) repeatedly pressured the management team in North Carolina to enhance the quarterly earnings statements. Since Healthsource, Inc., was using stock as collateral to acquire HMOs in other regions, sustaining the stock price was a high priority. Financial pressures overrode concerns about physician-patient relationships. Legal counsel reminded the Board members of the responsibility and ever present liability risks regarding "seeking value for shareholders." In 1996, when large companies made offers to purchase our company, there was basically no choice but to sell, even though the corporate culture of the acquiring company was opposed to our earlier purposes.

In the Triangle, our company evolved to become Healthsource NC, now Healthsource/CIGNA. For about a year before the actual acquisition by CIGNA, the physician Board of Directors in North Carolina was being overruled by corporate offices in New Hampshire. The decision to not pay back all of the physician's withhold from 1996 was entirely contrary to the Board's wishes. Board members privately applauded when physicians in the Wilmington area resigned in protest, but the Board was no longer in control.

As CIGNA and other companies continue the consolidation and corporatization of managed care, they are creating a leadership vacuum. I still believe that the best health care is regionally if not locally based, and that clinical sensitivity is best maintained through effective physician input. There is still an opportunity for physician groups to organize in response to public needs for health care. One lesson from our experience is that physician-initiated HMOs must have adequate capitalization to sustain control. If the undertaking is worthwhile (for doctors and patients), it justifies a financial commitment that will allow the organization to keep its focus and sustain its priorities. A second lesson is that to become dependent on outside investors or to seek quick profit from a sale is to invite a sequence of events that can override fundamental purposes. The preservation of our professionalism deserves top priority.

Despite the drastic changes in our medical system over the past 10 years, quality care and patient satisfaction are still basic expectations. Physicians are essential to guiding the decisions that shape the environment of health care. This vital role should not be forfeited to short-sighted, nonprofessional interests.

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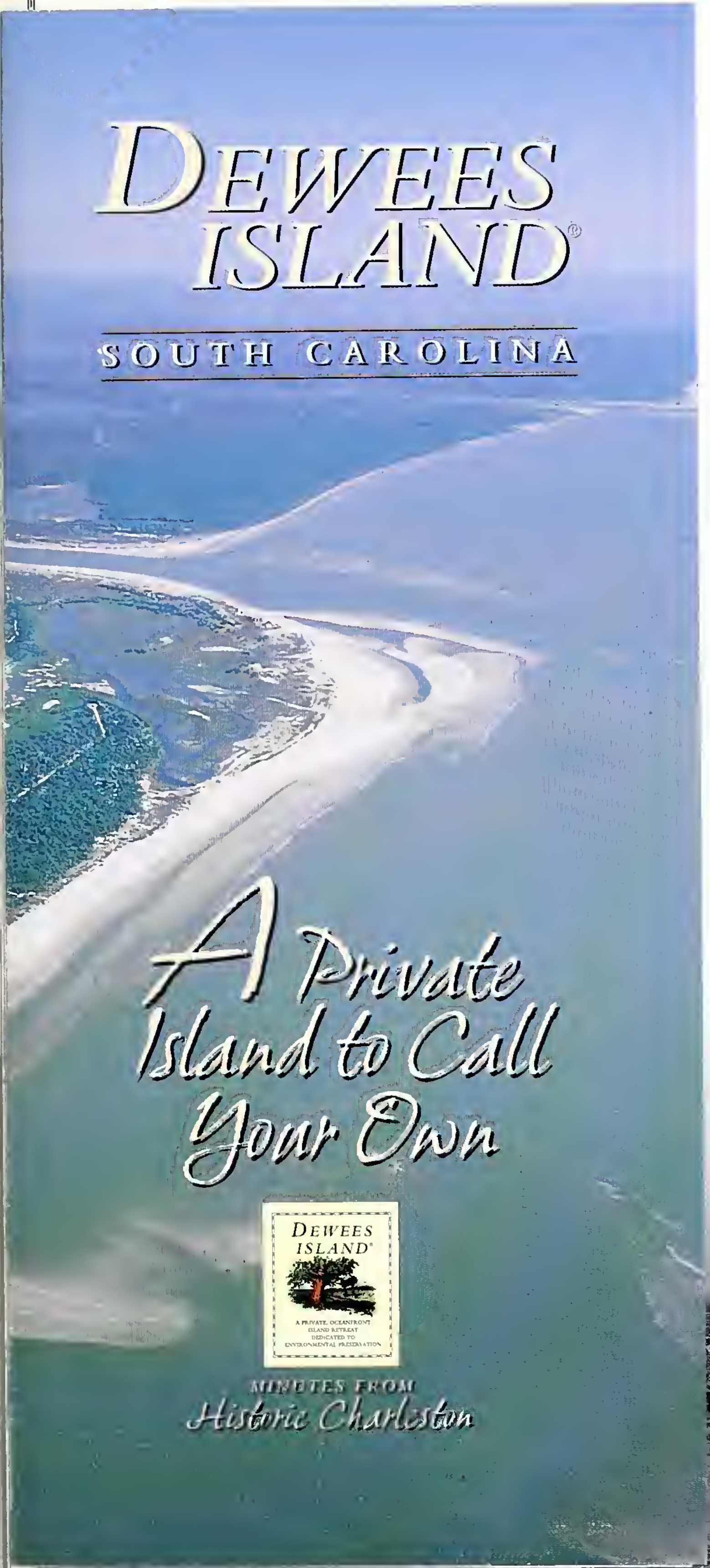
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An Open Letter to North Carolina Doctors:
Wall Street Mentality and He

To the Editor:

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Life on Dewees Island is quite a bit different from most resorts. Here your experience is defined moment by moment, the old-fashioned way. Instead of spending time laboring in the yard or chasing a golf ball, Dewee residents involve themselves in fishing, crabbing, shrimping, bird watching, strolling, and the art of relaxing. A full-time environmental educator-in-residence offers year-round education opportunities and stewardship programs for residents of all ages. Tennis courts, a swimming pool, and community docks serve as places for neighbors to meet, and enjoy each

marina...and all that the city of Mt. Pleasant has to offer is but ten minutes away.

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To the Editor:

As a former physician Board member of a managed care company in North Carolina, I want to let my fellow physicians know about recent policies and performances of that company. I am confident that I speak for about 60 other physicians who at one time or another served on the Board of Directors of Central Carolina Physicians Health Plan, which became Carolina Physicians Health Plan in 1988, and then Healthsource NC in 1994. I suspect that my thoughts are shared by physicians elsewhere in the state who have had similar experiences starting physician-owned and physician-directed health maintenance organizations (HMOs), only to have them subsumed by larger entities that use little or no physician guidance.

In the early to mid-1980s at least five such companies were founded in North Carolina. Other HMOs were beginning in urban portions of the state and their methods frustrated many physicians and their patients, leading some physicians to organize companies on the premise that the best way to influence the inevitable progression of managed care was for a regionally owned, physician-directed HMO to be a "player" in the process. Furthermore, health insurance premiums were increasing at a rate of 15%-50% every year. The message from corporate America and from governmental bodies was to change the health care delivery system. Systems were developed and steps taken to rein in costs. Many of us felt that physicians could do a better job of making the health care system more efficient than could persons of other backgrounds and perspectives. The Central Carolina Physicians Board of Directors felt that we could forge a broad network of physicians in the Triangle area to enhance quality of care and simultaneously improve cost-effectiveness. We also thought that by holding down costs the progressive rise in numbers of people without health insurance could be stopped, and we would have fewer patients in our practices with no insurance at all. It was an opportunity to serve the best interests of both our profession and our patients.

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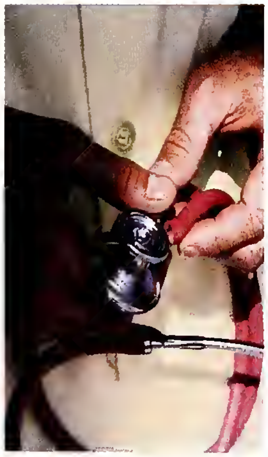

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Coccidioidomycosis in a Patient with Atopic Dermatitis

David K. Ohashi, PhD, John P. Ruppe, MD, Mary Lou Courrege, MD, and George G. Kletter, MD

Coccidioidomycosis is caused by infection with *Coccidioides immitis*, a soil fungus found in southern California, Arizona, New Mexico, and southwestern Texas as well as areas of Central and South America.[1] Infection occurs after inhalation of arthrospores which are released from filamentous hyphae growing in soil; rarely, transmission may occur by direct inoculation. Asymptomatic or mild, self-limiting pulmonary disease is the rule because most individuals are able to eradicate the spherule-endospore form of the fungus.

Until the arrival of the AIDS epidemic, only 0.5% of those infected developed extra-pulmonary disease.[2,3] Metastatic infection may occur in skin, bones, joints, and the central nervous system. Disseminated disease is more common in individuals with brown skin. When skin is infected, lesions develop most often on the face.[3] We present here a patient with atopic dermatitis who unexpectedly developed cutaneous coccidioidomycosis. His infection was controlled with itraconazole.

The Patient

A 21-year-old young man of African-American and Filipino heritage was seen in Wilmington, NC, for atopic dermatitis and wart-like lesions on his right hip. Since childhood he had atopic dermatitis of the extremities; during the previous 11 years he had lived in west central Texas where his

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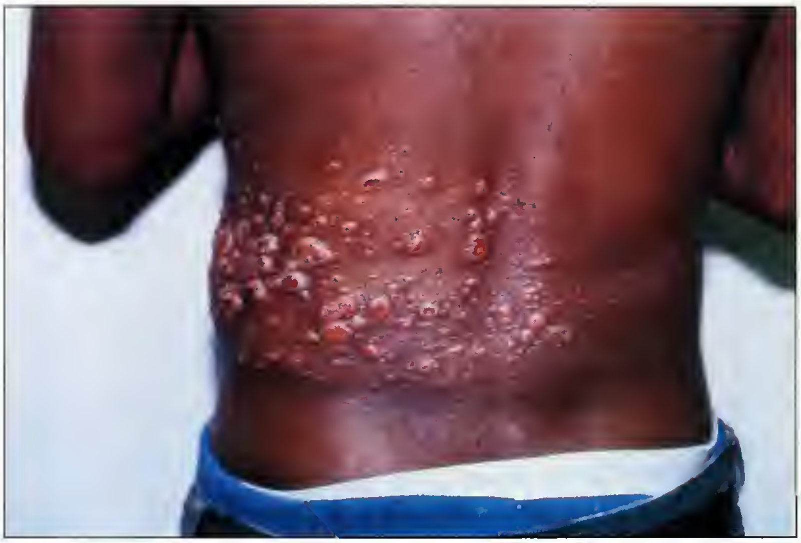

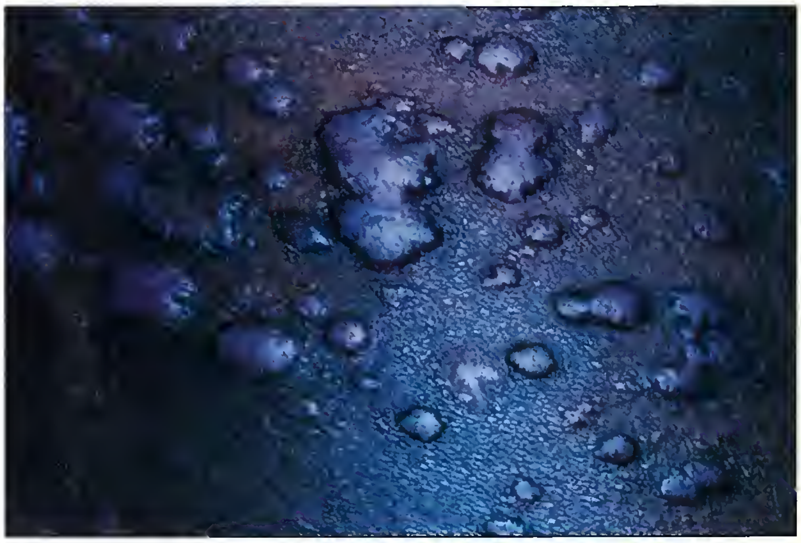

Fig 1a (top): Larger and smaller granulomas of coccidioidomycosis on patient's right lateral trunk before treatment with itraconazole. **Fig 1b** (bottom): Higher magnification of patient's skin depicts the numerous granulomas after approximately eight months of therapy.

dermatitis was treated with topical and oral steroids.

When we saw him first in Wilmington, he complained of a rash and itching "all over." There was diffuse scaling of the skin over his trunk, the anterior aspect of his legs, his arms and face. There was moderate lichenification on his trunk. Over his right hip there was a 2 cm keloid scar and large, protuberant, keratotic nodules, which were surrounded by many smaller lesions (Figures 1a & b, preceding page).

After three months, his atopic dermatitis had responded to treatment, but the nodules had increased in number (Figure 2, at right). Lumbar puncture showed normal fluid; his blood did not contain anti-HIV-1 antibodies. Chest x-ray was normal. All but a very few nodules were distributed over the right flank from the midline of his back to the midline of his abdomen. Biopsy of a large nodule showed a granuloma containing typical endosporulating spherules of *Coccidioidomycosis immitis*. The organism was subsequently grown in culture and identified by specific DNA probe. Serological testing showed elevated IgG antibodies to *C. immitis* antigens, but IgM antibodies were undetectable.

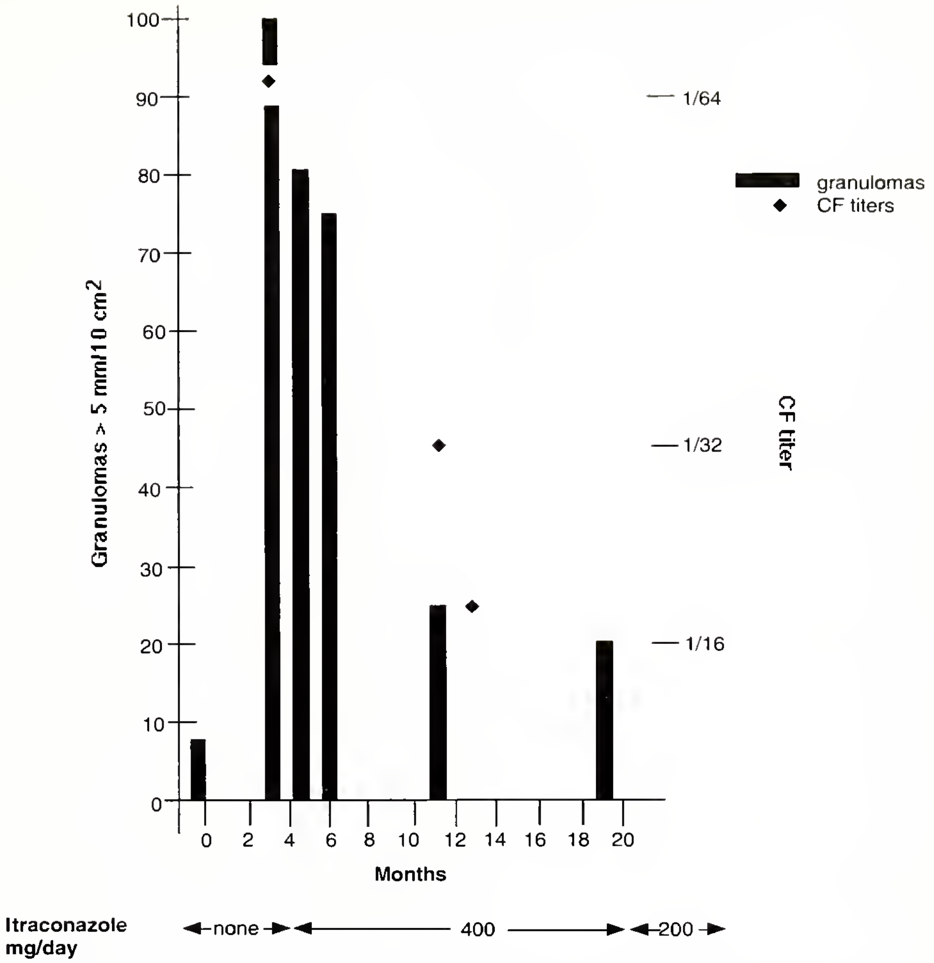

Fig 2: The number of large granulomas (>5mm in diameter) and complement fixation (CF) titers declined following administration of itraconazole. By the 11th month, fungi were not demonstrable by light microscopy in biopsy material.

He was treated with 200 mg itraconazole twice daily. After two weeks, serum levels of itraconazole and its hydroxy metabolite were 1.8 ug/mL and 3.9 ug/mL respectively (a summed concentration greater than 5 ug/mL is considered adequate[7,8] since both molecules have fungicidal activity).

We followed his clinical course using complement fixation titers, counting the number and size of his granulomas (Figure 2), and by biopsies. After 14 months his largest lesions had diminished in size, no new lesions had developed and his itraconazole dose had been reduced to 100 mg twice daily.

Discussion

Coccidioidomycosis is not rare, even in nonendemic areas like North Carolina, but cases are unexpected. According to Dr. John Perfect (personal communication), approximately one case per year is seen at Duke Medical Center.

The most striking cutaneous features in our patient were the large, protuberant nodules surrounded by numerous smaller lesions. Coccidioidal skin lesions may vary in appearance, from clusters of pustules to classic granulomas.[4] We never could determine why, in this young man, nearly all his lesions appeared on just his right lateral trunk, but he reported that the wart-like lesions had first developed along a scar from a traumatic injury to skin over his right hip.

The portal of entry was probably lung since the patient resided in a known endemic area for 11 years before moving to North Carolina. He had been hospitalized at age 19 for a spontaneous pneumothorax. If we are correct to surmise that the portal of entry was the lung, this patient represents a case of disseminated disease; if the infection occurred as a result of direct inoculation at the time of his hip injury, this may be a rare case of percutaneous transmission of *C. immitis*.

This young man was of Filipino and African heritage. There is some evidence Filipinos are at increased risk for disseminated disease compared with African-Americans, Mexican-Americans, or Native Americans.[3] The immunologic or genetic basis for this increased risk remains unknown. Coccidioidomycosis is often a mild or indolent disease, but individuals of all races who are coininfected with HIV-1 are at substantially higher risk for rapidly progressive and fatal disease.

Our patient was treated with twice-daily itraconazole as an outpatient, without complications and without the need for costly hospitalization. We chose itraconazole because it has a longer half-life than ketoconazole and has fewer side effects. Since there was no meningeal involvement, fluconazole was not needed.[5,6]

Despite the ability of itraconazole to greatly reduce fungal load, complete eradication is not assured. One study in Mexico noted a 25% relapse rate, with relapses occurring as long as 14 months after treatment.[11] This implies that suppressive therapy should be continued indefinitely in cases of disseminated disease.

The risk of relapse is far greater in individuals of brown-skinned ancestry, but the reason for this is unknown.[6,9] Since itraconazole-resistant forms of *C. immitis* have never been reported, it is likely that relapses following discontinuance of therapy are due to an immune defect. The endospores of *C. immitis* contain a powerful urease; perhaps the ammonia produced by this enzyme alters phagosomal pH and interferes with the biochemical contour of fungal proteins in macrophages.[10] This would interfere with T-helper cell response and limit the immune response. ❑

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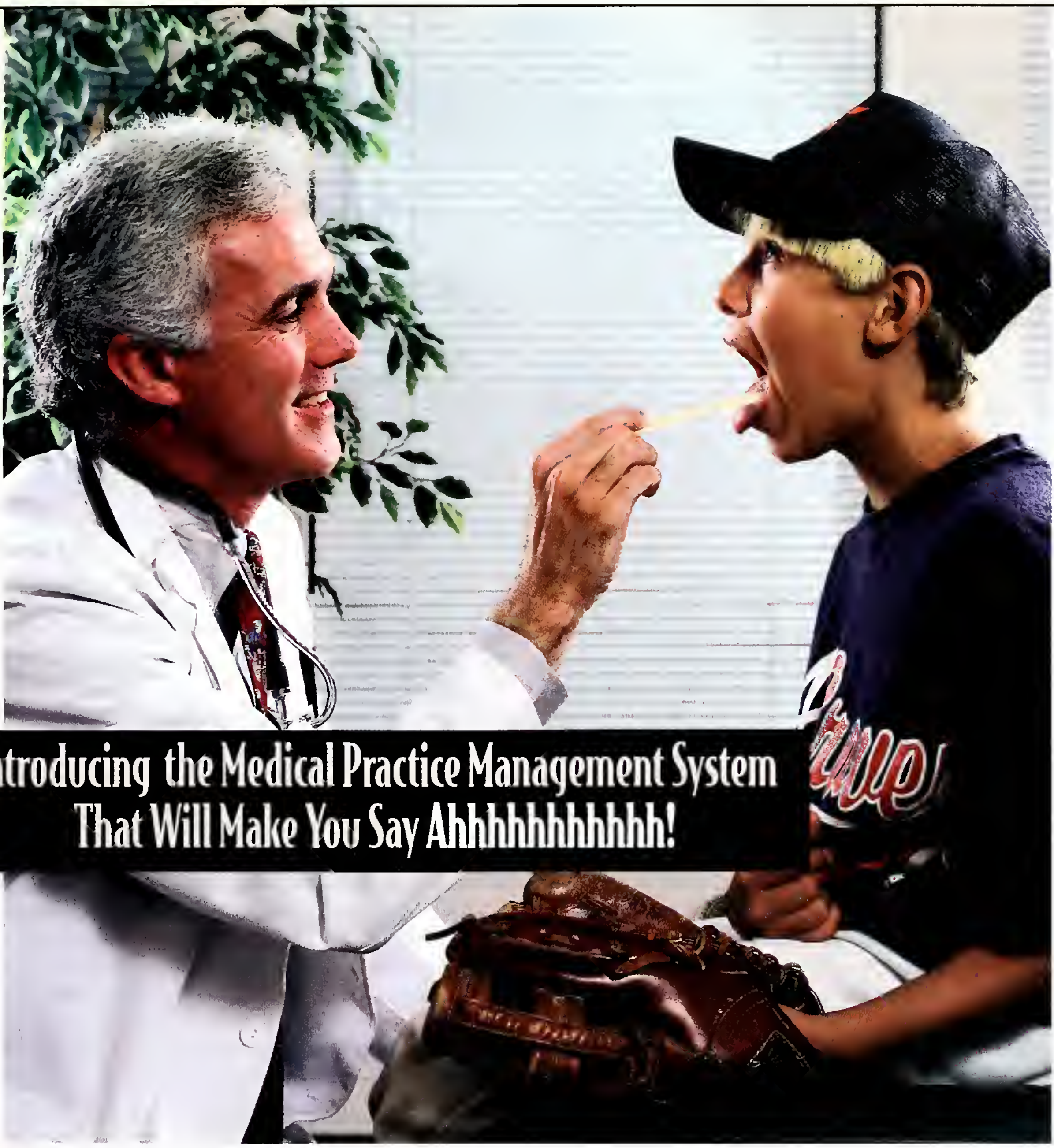

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Colocutaneous Fistula

A Rare Complication of Percutaneous Gastrostomy

Susan E. Smith, MD, and Thomas V. Clancy, MD, FACS

Percutaneous placement of a gastrostomy was first reported in 1979, and one year later percutaneous, endoscopic gastrostomy (PEG) was introduced. Since then, PEG has become the favored technique for providing enteral alimentation to patients who cannot eat.[1,2] Open gastrostomy is reserved for patients undergoing celiotomy for other reasons, and for the few patients in whom medical conditions preclude a percutaneous endoscopic approach. PEG placement is a relatively simple procedure, often performed on outpatients, but complications are not uncommon.

Complications may be minor or major, local or systemic. They include wound infections such as cellulitis, tube malfunction or dislodgment, and aspiration pneumonia.[3,4] Colocutaneous fistula is a rare complication of PEG placement, which may present as a change in bowel habits (diarrhea or evidence of unabsorbed enteral formula in the stool) or as the drainage of stool from the tube insertion site. We describe here two cases of colocutaneous fistulae following PEG tube placement and survey the literature on this subject.

The First Patient

A 72-year-old woman had multiple medical problems: hypertension, coronary artery disease, multiple cerebrovascular accidents, multi-infarct dementia, diabetes mellitus, and supraventricular tachycardia. She was hospitalized because of acute mental status changes caused by ketoacidosis. Her symptoms improved with medical treatment, but she had difficulty taking oral nourishment. A swallowing study demonstrated aspiration. She underwent uneventful PEG tube insertion using local anesthesia and intravenous sedation. Enteral nutrition was begun without difficulty on the first postoperative day, and the patient was returned to the nursing home.

Three months later the tube was reported to be "not working." The tube was changed without difficulty in the outpatient clinic using a Bard replacement kit. Two days later the patient came to the Emergency Department because of frequent bowel movements containing enteral formula. She was hemodynamically stable, and there was no evidence of peritonitis. Radiographs of the chest and abdomen were normal. The white blood cell count was 4.8 with a normal differential, and serum electrolyte concentrations were normal. A computed tomogram (CT) of the abdomen, performed with both intravenous and oral contrast material, showed that the gastric portion of the PEG tube had migrated out of the stomach and was located between the stomach and the splenic flexure of the colon. Liquid radiographic contrast material (Gastrograffin), injected through the PEG, entered both the stomach and the colon. There was no free air or extravasation of contrast.

Enteral nourishment was stopped, and the patient was begun on intravenous fluids. A nasogastric tube was connected to suction and the PEG tube to gravity drainage. Shortly after midnight the patient was found unresponsive. She was resuscitated, intubated, and transferred to the intensive care unit. The abdomen remained soft and without peritoneal signs. Urosepsis was diagnosed and treated. She was weaned off the ventilator within three days and transferred out of the intensive care unit. The patient's family asked that treatment be restricted to comfort care only because of the complexity of her overall condition. She expired three days later.

The Second Patient

A 64-year-old man with a history of stroke, dementia, seizure disorder, and hypertension was brought from the nursing home for PEG placement in order to provide enteral nutrition. The

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procedure was performed without difficulty as an outpatient. Enteral feeding was begun the day after the procedure and was well tolerated. Six months later, the tube was reported to be "not working." It had been shortened several times over the preceding months in order to improve its function, but had become difficult to use at the bedside. The tube was removed without difficulty in the outpatient clinic and a Foley catheter with a 5 cc balloon was inserted.

Three days after tube change, the patient was brought to the Emergency Department because of diarrhea containing enteral formula. Fecal material was present at the tube insertion site. The patient did not appear ill, and his abdomen was soft and nontender. Vital signs were all within normal limits. Abdominal radiographs demonstrated a normal bowel gas pattern and the absence of free air under the diaphragm. Gastrograffin introduced through the PEG tube entered the transverse and descending colon. There was no evidence of large bowel obstruction. No contrast material entered the stomach or small bowel, and there was no intra-abdominal extravasation of contrast material.

Enteral nourishment was stopped and the patient was treated with intravenous fluids. Esophagogastroduodenoscopy (EGD) showed that the PEG tube exit site in the anterior wall of the stomach was healing normally and there was no evidence of other pathology. Introduction of a small-bore, silastic, nasogastric tube allowed resumption of enteral (elemental) nutrition. The PEG tube was removed from the colon at bedside. The colocutaneous fistula was covered with an ostomy bag and allowed to close spontaneously. The patient was returned to the nursing home after three days during which the elemental diet was well tolerated and the fistula output minimal.

Discussion

The PEG technique of tube placement was one of the first widely adopted minimally invasive procedures in general surgery. It transformed a hospital procedure requiring general anesthesia and celiotomy into a brief, outpatient encounter under local anesthesia and intravenous sedation. But the ease with which the procedure can be performed does not diminish the wide array of accompanying complications. Clinical indications and patient selection greatly influence the morbidity and mortality associated with this procedure.

Localized complications may be wound-related (infection, hematoma, gastric bleeding), or tube-related (tube migration, malfunction, premature dislodgment). Systemic complications include peritonitis, sepsis, aspiration, pneumonia, and death. Fistulae are relatively infrequent complications, but of these gastrocutaneous fistulae are the more common and colocutaneous fistulae, rare. We found no reports of small bowel fistulae after PEG placement.

There are many potential (and speculative) causes of colocutaneous fistulae after PEG placement. A lax mesentery or distention of the colon (ileus) or both are common in geriatric patients who require this procedure. These conditions may predispose the colon to injury during needle insertion, or the tube may erode into the colon if interposed between stomach and anterior abdominal wall. Formation of a fistula tract may occur during a difficult tube replacement.[5] Previous abdominal surgery and adhesions may place the colon at increased risk as during percutaneous needle insertions for treatments such as peritoneal lavage.[6] The fistula may be the result of colon injury during initial tube placement but remain asymptomatic until site manipulation or subsequent tube change. Acute or chronic outward traction on the tube (being caught on bed rail or chair during patient transport, or in turning, sleeping, ambulation) or chronic pulling on the tube by an unrestrained, disoriented patient may traumatize an otherwise satisfactorily functioning gastrocutaneous fistula tract. Progressive deterioration in physiologic status (malnutrition, immune depression, or infection) may dispose patients to tissue erosion by the tube.

Two techniques are regularly recommended to minimize bowel injury during PEG placement.[7] Endoscopic transillumination through the anterior wall of the stomach is a prerequisite to optimizing safety in blind needle passage. Endoscopic observation that finger pressure on the abdomen produces a sharp indentation of the anterior stomach wall suggests that other organs have not become interposed between the stomach and the parietal peritoneum. Both findings are essential to safe placement of a PEG tube.

Colocutaneous fistula may appear at any time following PEG placement. The two cases recorded here demonstrate some important clinical features that may herald the diagnosis of colocutaneous fistula. Tube problems (report of tube "not working") were present in both for indeterminate periods of time prior to surgical consultation. Both colocutaneous fistulae were first observed and definitively diagnosed long (three and six months) after the initial procedure. Other reports show that the interval between initial procedure and presentation of fistulae ranges from three days to as long as eight months.[5,8-12] In our patients, the tubes were changed two and three days, respectively, before the Emergency Department visits at which diagnosis was made. Characteristic clinical signs of the underlying pathology—sudden change in bowel habits (diarrhea), enteral formula in stool, and the presence of stool (drainage/foul smell) at tube site—were noted in both cases. Reported signs not seen in our patients include feculent vomiting[9] and fecal drainage from the PEG tube.[5,12]

Clinical diagnosis of colocutaneous fistula was confirmed by introducing contrast material through the PEG tube to evaluate the tract, observe hollow viscus filling, and rule out extravasation. A CT scan in one patient determined the exact location of the tube, and excluded free intra-abdominal air and extra-intestinal fluid collection. EGD was performed in the second case to determine whether some portion of the tube remained in the stomach and to search for acute stomach perforation and evidence of gastrocolic fistula.

Management of colocutaneous fistulae is based on the type of fistula, the severity of the patient's illness, abdominal findings on physical examination, and the patient's or family's wishes. Both of our patients were managed nonoperatively because there was no evidence of intra-abdominal leakage or sepsis; this approach is often successful.[8,9,11,12] Gastrocolic fistulae usually requires operation, but most colocutaneous fistulae close spontaneously if there is no distal bowel obstruction. Persistent gastrocolic fistula and direct placement of the PEG tube into the colon require surgery.[5,9]

The potential for developing colocutaneous fistulae should be considered in all patients who undergo PEG, especially the elderly. Even the lapse of a prolonged time interval from initial procedure does not preclude the development of a serious complication. "Tube not working" complaints warrant early evaluation. Given the great morbidity and mortality associated with procedures performed on such a high-risk population, attention to both tube and bowel function remains an important aspect of clinical care in the post-PEG population. Complications associated with percutaneous endoscopic gastrostomy are common, but colocutaneous fistula is, fortunately, rare. Recognizing this complication allows earlier treatment and a better outcome. ❑

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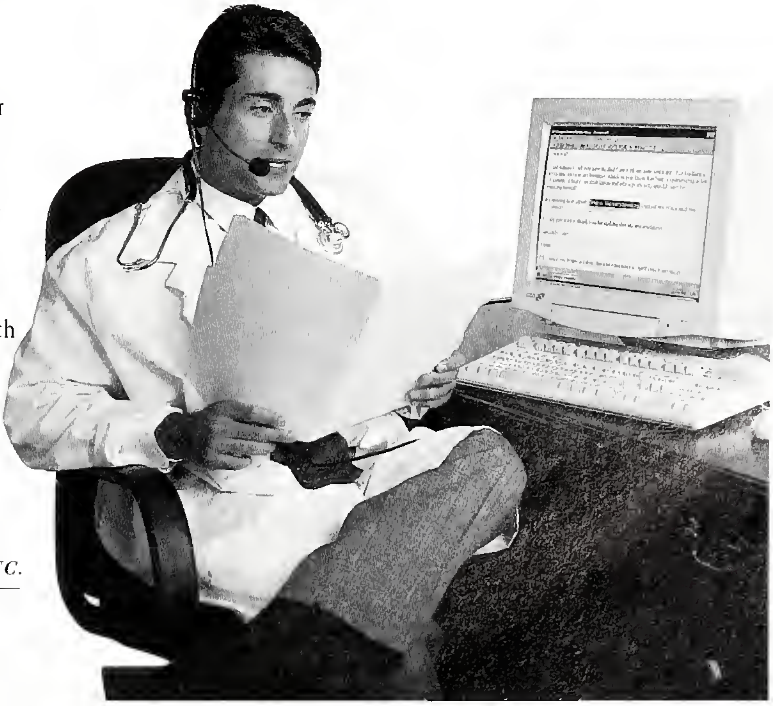

Bloody Diarrhea Caused by Escherichia Coli O157:H7

Douglas C. Brewer, MD, and Linda L. Willis, MD

Diarrhea has become, if not a topic for polite conversation, at least acceptable television fare. Usually the acute onset of frequent, loose stools is a self-limited annoyance; occasionally it requires brief treatment; in relatively uncommon situations, especially when accompanied by blood, it is the harbinger of serious vascular, inflammatory, or infectious disease. We report here our experience with a patient whose bloody diarrhea was due to malignant (and well-publicized) variant of the common colon bacillus, *Escherichia coli* (*E. coli*).

Our Patient

A 32-year-old woman came to us August 18, 1997, because of two days of lower abdominal cramps and passage of stool intermixed with blood, which later became pure bloody diarrhea. There was no nausea or vomiting. There was no history of recent antibiotic use or travel outside of eastern North Carolina. There were significant, but not clearly related, elements of the past medical history. Two years earlier, she had undergone lumbar laminectomy for severe right leg pain, but the pain persisted and she developed a blue right foot after surgery. A 90% stenosis of the abdominal aorta was found and corrected by endarterectomy. Her serum cholesterol was 302 mg/dL (falling to 152 on 40 mg daily of simvastatin), and her serum homocysteine was 11.2 µmol/L (falling to 5.2 after treatment with folate).

She was offered, but refused proctoscopy. Cultures of stool, including one specifically for *E. coli O157:H7*, were collected in the office and taken directly to Wilson Memorial Hospital for prompt plating.

Four hours after the first visit she phoned back complaining of worsening abdominal pain, new nausea, and persistent diarrhea. She was given ciprofloxacin, 500 mg twice daily, but severe cramping, nausea (preventing oral intake), and bloody diarrhea continued.

Because of the persistent symptoms, she was seen again. Her temperature was 98.6°F; blood pressure, 90/60 mm Hg; and heart rate, 76. Physical examination was otherwise normal except for moderate epigastric and severe right lower quadrant tenderness without rebound. Rigid proctoscopy to 16 cm showed normal distal colon mucosa without ulcers or friability. Blood clots were seen beyond the proctoscope.

She was hospitalized, treated with intravenous ciprofloxin and metronidazole, and hydrated with intravenous saline. A spiral computerized tomographic (CT) scan of the abdomen (Figure 1, next page) showed no evidence of aortic-enteric fistula from her prior aortic surgery, but did show marked thickening of the bowel wall of the ascending (A) and transverse (T) colon. The was no evidence (not shown) of occlusion of the superior mesenteric artery to suggest ischemic colitis.

She did not develop renal impairment as shown by the fact that daily measurements of serum creatinine concentration remained below 0.8 mg/dL. On the second hospital day the initial stool culture was reported to have grown *E. coli O157:H7*, but no *Shigella*, *Salmonella*, *Yersinia*, or *Campylobacter*. Repeat cultures after two oral doses of ciprofloxacin were negative for *E. coli O157:H7*. She was discharged on oral ciprofloxacin and metronidazole after the fourth hospital day.

Discussion

Gastroenteritis caused by *E. coli O157:H7* can be life-threatening.[1-3] Infection with this organism can result in bloody or nonbloody[4] diarrhea, or in the hemolytic uremic syndrome.[2] It can obviously cause dangerous and potentially catastrophic infection. Our patient was extremely ill but afebrile as is typical for *E. coli O157* illness.[1] Proximal, not distal, colon was involved in our patient as shown by the normal distal mucosa at proctoscopy and the striking mucosal thickening of ascending and transverse colon seen on CT scan.

The most notorious mode of transmission of *E. coli O157:H7* is via eating poorly cooked, contaminated ground beef. In 1994,

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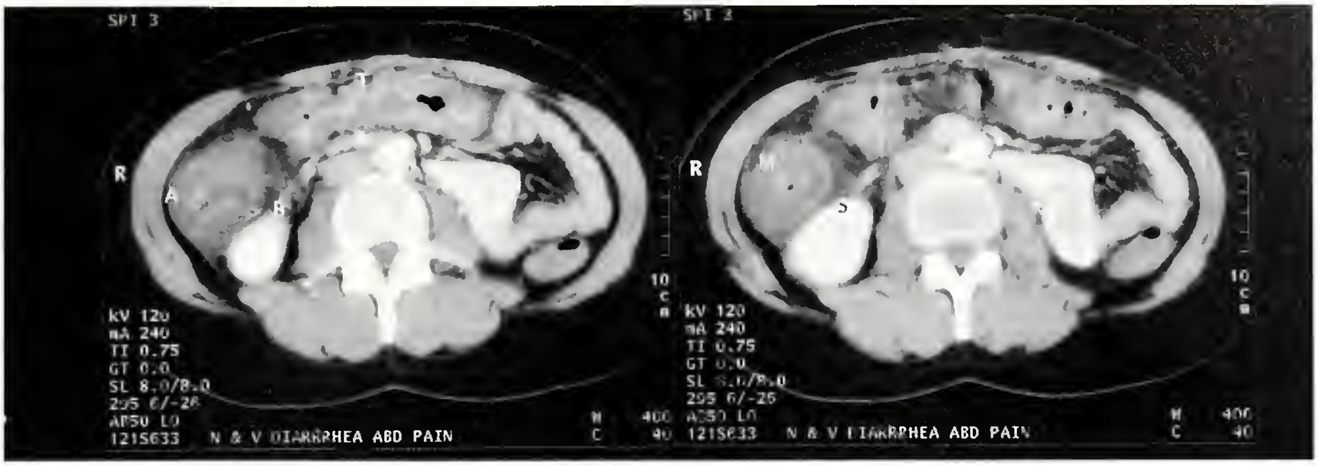

Fig 1: Images obtained by a Somatron plus 4 spiral CT scanner after administration of intravenous contrast show marked thickening of the bowel wall of the ascending (A) and transverse (T) colon. The "target" appearance of the colon is due to a bright inner ring (mucosa), a lower density ring (widened submucosa), and a bright outer ring made up of muscularis propria (M) and serosa (S). Adjacent fat shows stranding but no fluid collections to suggest abcess.

national attention was called to this by a large epidemic of bloody diarrhea and hemolytic-uraemic syndrome in Washington state associated with hamburgers served at a fast food chain.[2] Waterborne[5] as well as person-to-person[4] spread of *E. coli O157:H7* is possible.

Perhaps of importance, a large national recall of possibly contaminated hamburger occurred in August 1997, just at the time our patient presented. She had, in fact, eaten hamburgers at three separate national fast food chains in Greenville, NC, on each of the three days prior to her illness, although it is not known whether these were the source of her infection.

Our patient's symptoms might have been caused by inflammatory bowel disease, but her rectal mucosa had no abnormalities to suggest ulcerative colitis and the CT appearance of the terminal ileum did not suggest Crohn's disease. Furthermore, she had no history of prior antibiotic use to suggest pseudomembranous enterocolitis.

In fact, the CT findings in our patient were quite compatible with an infectious process, which produces mural thickening in typical patterns. *Shigella* usually involves the left side on the colon distal to the splenic flexure; *Salmonella* affects the rectum and sigmoid; *Camplylobacter* is usually a pancolitis. *Yersinia* involves the right colon but extends into the terminal ileum. Tuberculosis involves the cecum and terminal ileum. *E. coli O157* typically causes thickening of the transverse colon wall, possibly extending into the right colon, but usually sparing the left colon,[6,7] as in our patient.

Infection with *E. coli O157:H7* may be devastating. In the generally healthy population affected during the Washington outbreak, three of 501 cases died,[2] but a striking 35% (19 of 55) of residents infected in a nursing home outbreak died.[1] We recommend that physicians obtain appropriate stool cultures in cases of acute diarrheal illnesses, especially when accompanied by unexplained hematochezia or bloody diarrhea. Our hospital lab currently tests for *E. coli O157:H7* only when specifically requested, but since simple diarrhea and well as bloody diarrhea can be caused by *E. coli O157:H7*[4] it may be prudent to search for it along with *Shigella, Salmonella, Yersinia,* and *Campylobacter* in routine stool cultures. In general, negative culture results are more certain if the specimen has been immediately plated at a nearby CLIA-approved lab, rather than being transported to a distant reference lab. Rapid reporting of the specific cause of infectious diarrhea is important not just to guide specific clinical decisions, but to locate the source of infection and curtail further spread. Since waterborne transmission has been well documented,[5] it is imperative that water treatment plants be engineered and upgraded so as to never discharge untreated raw sewage. ❑

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1/23/98

Niacin

Help For Your Cholesterol—Harm For Your Liver

R. Michael Rourk, MD, FACP, and Najeeb U. Rehman, MD

Niacin (nicotinic acid) is a water-soluble B vitamin that can effectively lower plasma total cholesterol and triglycerides and increase high-density lipoprotein cholesterol. Treatment with niacin can reduce all-cause and coronary heart disease mortality.[1] Niacin is cheap and is available in two preparations: an immediate release (IR) or crystalline form and a sustained release (SR) preparation, which was developed to combat the unpleasant cutaneous flushing that often accompanies use of the IR form. Besides flushing, however, there are other more serious side effects of both forms of niacin, including hepatotoxicity. We present the case of a woman who took inappropriately high doses of niacin, producing acute icteric hepatitis.

Our Patient

A 46-year-old woman was referred for gastroenterology consultation because of 3 weeks of malaise, fatigue, jaundice, and right upper-quadrant abdominal pain. She had no nausea, vomiting, diarrhea, or fever. She did not drink alcohol. There was no history of unusual travel or food intake. She was known to have hypertension, for which she was taking Norvasc® and Altace®. She denied using other medications or herbal remedies.

On examination she was afebrile and jaundiced. There were no stigmata of chronic liver disease. Palpation of the abdomen revealed right upper-quadrant tenderness, but no organomegaly, masses, or rebound tenderness. Initial laboratory evaluation revealed a total bilirubin of 6.2 mg/dL (normal 0.1-1.0) and direct bilirubin of 4.2 mg/dL (normal 0-0.2); alanine aminotransferase (ALT) 2081 IU/L (normal 7-35), aspartate aminotransferase (AST) 1155 IU/L (normal 0-35), alkaline phosphatase 295 IU/L (normal 25-150), gamma glutamyl transpeptidase (GGTP) 522 IU/L (normal 45-300). The blood leukocyte count was 10.2. An abdominal ultrasound revealed cholelithiasis, but the biliary tree was not dilated.

The patient underwent endoscopic retrograde cholangiopancreatography (ERCP) which confirmed cholelithiasis, but found no ductal abnormalities. A percutaneous liver biopsy showed acute hepatitis characterized primarily by polymorphonuclear leukocyte and eosinophil infiltrates in a periportal distribution. Viral markers for hepatitis A, B, and C, Epstein-Barr, cytomegalovirus, herpes, and adenovirus were negative. ANA was negative.

Total bilirubin, AST and ALT peaked at 15.1 (mg/dL), 4282 (IU/L) and 2301 (IU/L), respectively. Her prothrombin time remained normal. She was followed closely for but did not develop encephalopathy or fulminant liver failure. Bilirubin and transaminases gradually returned to normal over a three-week period, but several weeks later, she developed acute cholecystitis. She underwent laparoscopic cholecystectomy and repeat liver biopsy, which showed only minimal periportal inflammation and slight fibrosis.

During the course of her evaluation the patient revealed that, because of a mildly elevated serum cholesterol, she had begun taking niacin tablets several weeks prior to the onset of her illness. She produced a photocopy of a physician's handwritten "step-up" schedule for niacin treatment. It was based on use of a 100 mg IR tablet, and, in hopes of minimizing cutaneous flushing, called for gradually increasing doses to reach a maximum of 3 gms daily. The dispensing pharmacist had no 100 mg tablets and so substituted 500 mg tablets, which the patient took on the step-up schedule intended for the 100 mg doses. After three weeks, she was taking twenty 500 mg niacin tablets (10 grams) every day. She stopped taking niacin when she came to us for medical attention.

Discussion

Cutaneous flushing is the most commonly encountered side effect of niacin therapy, but more serious complications include hepatotoxicity, hyperglycemia with exacerbation of diabetes mellitus, and hyperuricemia. Other gastrointestinal side effects include heartburn, dyspepsia, exacerbation of peptic ulcer disease, and diarrhea.[1]

Hepatic injury is thought to be dose-related, but the mechanism of toxicity is unknown. Histopathologic findings show centrilobular cholestasis and parenchymal necrosis.[2] Cholestatic jaundice and elevations of serum transaminase levels are the most common clinical abnormalities seen.

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Our patient developed hepatotoxicity while taking excessive amounts of IR niacin, but hepatotoxicity from SR forms of niacin is well documented, and fulminant liver failure necessitating liver transplantation has been reported.[3] Clinically significant hepatotoxicity can be seen with daily doses as low as 900 mg of IR or 500 mg of SR niacin, regimens well within the guidelines for the treatment of hyperlipidemia.[4] Hepatotoxicity appears particularly often after changing (either deliberately or inadvertently) from IR to SR form at the same dosage; it may occur within days.[5] The spectrum of liver injury ranges from asymptomatic "transaminitis" to fulminant hepatic failure.

Because niacin is a vitamin, many individuals (including health care professionals) do not consider it a medication. As the public becomes more aware of the importance of controlling elevated blood cholesterol levels, the potential for use and misuse of niacin by the public rises. In our patient's case, the preparation she took is available over the counter, but it was originally filled by prescription and subsequently refilled by the same pharmacist four times over a five-week period. She was given a total of 600 tablets during this period of time. Pharmacy records indicate the pharmacist was aware the patient was taking 10 grams daily. This scenario underscores the importance of educating health care professionals as well as the public about the potential hazards of niacin. Health care professionals, particularly pharmacists, tend to be unaware of its dangers.[6]

Given the serious threat of hepatotoxicity, we believe that niacin, especially preparations containing more than 100 mg per dose, should be available by prescription only. Furthermore, physicians should inform patients of its potential dangers and exercise the same diligence when prescribing niacin that they do with other potentially dangerous medications.

And if you ever see a patient with acute hepatitis, always ask about niacin! ❑

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How Does North Carolina Law Enforcement Limit Youth Access to Tobacco Products?

A Study of Officers' Attitudes and Behaviors

Adam O. Goldstein, MD, Rachel A. Sobel, Jim D. Martin, MS, Susan D. Crocker, and Sally Herndon Malek, MPH

Tobacco use in North Carolina causes more deaths than alcohol, illegal drugs, auto crashes, fires, AIDS, homicides, and suicides combined—more than 11,000 deaths per year.[1,2] Nationally, more than 3000 minors begin to smoke every day—one million new smokers a year.[3] Approximately 90% of tobacco users begin when they are less than 18 years old[4] and 60% begin before age 14.[4,5] In the past two decades, the mean age of initiation has dropped from 16 to 12 years of age.[6] Currently, 31% of North Carolina youths under 18 smoke cigarettes, and 11% use smokeless tobacco.[7]

In 1991, US teens smoked approximately 28 million cigarettes per day (516 million packs per year). In North Carolina, 4.5 million packs of cigarettes, costing $6.8 million, are sold—illegally!—to minors.[8] Despite the fact that tobacco sales to minors are illegal in the US, tobacco products are easily accessible. In NC, a recent study found that one out of every two merchants would sell tobacco products to minors, and that youths had a 94% success rate in buying tobacco products from vending machines.[9] A 1996 annual compliance check by the North Carolina Department of Human Resources found that 50% of underage buyers succeeded in purchasing tobacco.[10]

If we are to decrease the illegal sales of tobacco to minors, North Carolina law enforcement officers must actively enforce the law prohibiting the sale and distribution of tobacco products to persons less than 18 years of age. Since it is not known to what extent law officers are willing or able to enforce this law, we studied current attitudes and behaviors of law enforcement officers about youth access to tobacco.

Methods

In summer 1996, NC Project ASSIST (American Stop Smoking Intervention Study), NC Department of Human Resources, NC Association of Chiefs of Police, NC Sheriffs' Association, and other law enforcement agencies sponsored regional training conferences titled "Protect and Serve: Reducing Tobacco Sales to Children." These one-day training conferences, held in four locations across the state, attracted officers from 50 counties and 70 cities and towns. The conferences were designed to raise awareness of youth access to tobacco, to begin a dialogue with law officers on the youth access to tobacco law, and to promote active enforcement of the law. The conferences focused on state and federal youth access to tobacco laws, the status of youth access in North Carolina, strategies for conducting merchant and community education, and ways to check compliance to document the extent of the problem and as part of overall enforcement strategy.

The training conferences culminated in presentations by the Cary Police Department on its model education and enforcement initiative to limit youth access to tobacco. Uniformed Cary police officers, in partnership with the Cary Chamber of Commerce, conducted face-to-face visits and discussions with every local retailer of tobacco products. Following that extensive educational effort, a two-day enforcement operation was carried out after consultation with the local district attorney and other county officials. The community was notified of the enforcement operation through the media. Violating merchants were issued citations and those who did not sell tobacco products to minors were rewarded. The initiative received excellent media coverage and raised awareness throughout the community of youth access to tobacco and North Carolina's youth access to tobacco laws.

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In early 1997, we sent a questionnaire to the 167 law enforcement officers who completed the eight-hour Protect and Serve regional training conference and received continuing education credit for attendance. We asked 27 questions designed to measure how effectively the training conferences prepared officers to enforce North Carolina's youth access law, attitudes toward the law, barriers to enforcement, and the degree to which the access law was being enforced. After three follow-up mailings, 120 law enforcement officers (72%) responded. The data were analyzed using Epi Info (Version 6.02).

Results

The 120 respondents represented 42 counties and 57 cities and towns across the state, including tobacco producing and nonproducing counties (and five of the top 10 producing counties). The officers identified 14 police units as responsible for enforcing NC's youth access to tobacco law, ranging from patrol (most frequent) and DARE/school resource officers to crime prevention, investigation, and vice. Despite the wide range of units identified as responsible for enforcement, 44% of officers said that no people in their unit currently worked on enforcement, and 12% said that one person did.

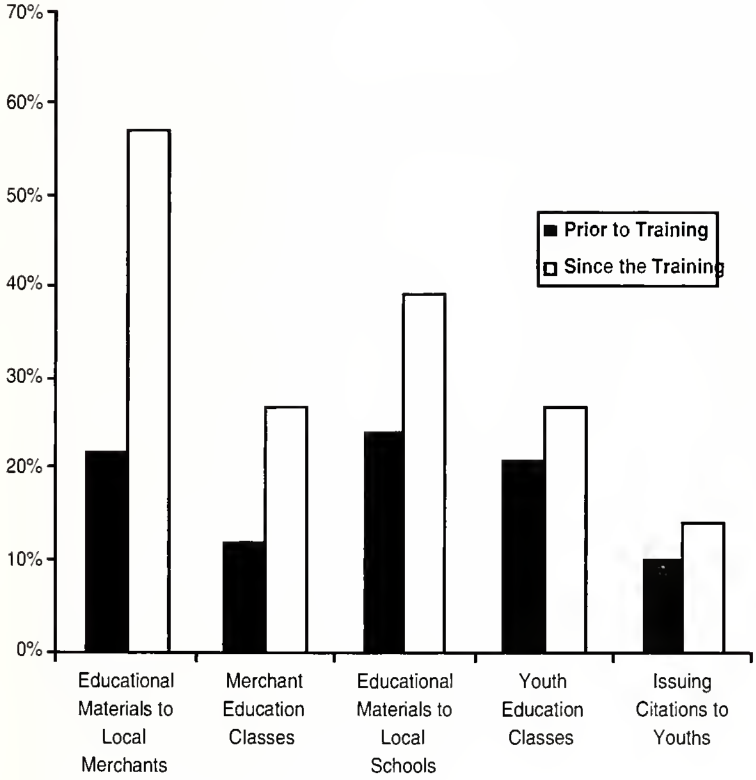

Fig 1: Participation of NC law enforcement officers in activities related to the enforcement of NC's youth access to tobacco law.

Enforcement activities. Officers were asked to identify the enforcement activities with which they were involved, both before and after the training. As expected, more reported participating in education and enforcement activities after training than before. However, even after the training conference less than 50% of officers reported involvement with merchants (except to distribute educational material), with distributing educational materials to local youths, or with issuing citations to youths who illegally purchased tobacco products (Figure 1, below). Regardless of training, less than 20% of law enforcement officers had issued citations to merchants for illegally selling tobacco products to youths (Figure 2, next page).

Barriers to enforcement. Seventy-four percent of the respondents noted barriers (lack of manpower, time, funding, and a poorly written law) to the enforcement of the access law (Table 1, next page). In a separate question, the officers were asked to identify tools and resources needed to better enforce the law. Funding and manpower, chosen by 50% or more of the respondents, were the two top choices, but 30% identified the need for better community support. Currently, 41% of the respondents work with community agencies, organizations, or groups concerned with youth access to tobacco, most predominantly in the area of youth education. Only 12% have worked with a local district attorney concerning enforcement. Twelve percent had contacted the media regarding their enforcement activities, and most of these received media coverage.

Attitudes toward changing the law. Only 13% of the respondents thought that their departments' current efforts greatly reduce the number of merchants who sell tobacco products to youths under age 18. Only 15% stated that the access law, as written and enforced at the time of the survey, greatly reduced the number of merchants who sold tobacco products to underage youths. An overwhelming majority of officers supported changes to strengthen the law (Table 2, next page). Thirty-nine percent of respondents stated that they or their department would be more involved in such efforts in the coming year, and 46% would remain at the same level of involvement.

Discussion

Our report shows that the training conferences, while successful in preparing law enforcement officers to better enforce the access law, did not lead to immediate enforcement operations in the field. Since, by virtue of their participation in the training, our respondents were already interested in the issue of youth access to tobacco, the results represent a "best-case scenario" of officer involvement in enforcement. Interest in enforcement was enhanced by the conferences, but several barriers restricted active involvement in enforcement.

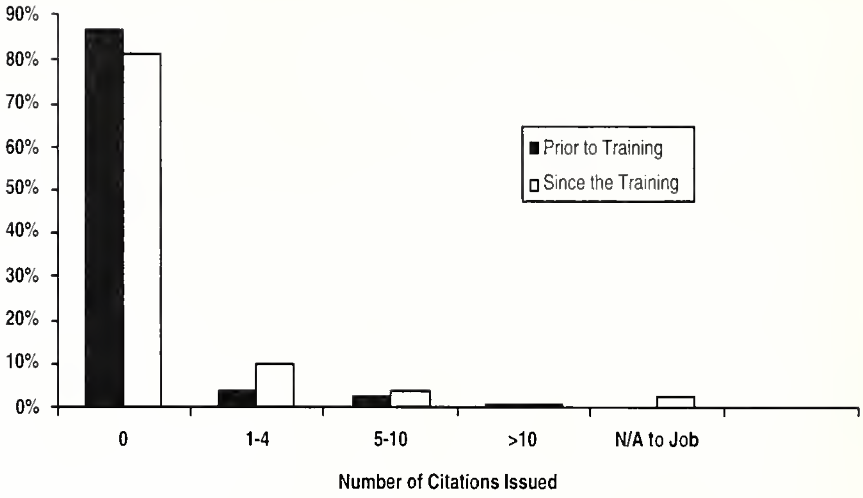

Fig 2: Percent of NC law enforcement officers who issued citations to merchants for illegally selling tobacco products to minors.

Many officers distributed educational materials to local merchants, but few had issued citations for illegally selling tobacco products to minors. Unfortunately, education without enforcement does not decrease the number of merchants who sell tobacco to minors or the number of minors who smoke.[11,12] North Carolina's 1995 compliance testing confirmed that merchant education alone has little impact on reducing youth access to tobacco. Areas that received intensive merchant education did not have any better compliance than those that did not.[11] On the other hand, education followed by enforcement does reduce illegal sales.[13] By combining education with enforcement, law officers play a "proactive" role in reducing tobacco consumption by youths and possibly prevent further substance abuse to which tobacco use can lead (teenagers who smoke are three times more likely to consume alcohol, eight times more likely to smoke marijuana, and 22 times more likely to use cocaine[14]).

Keys to increased officer involvement include recognizing barriers to enforcement and providing tools and resources needed by police and sheriff departments to better enforce the law. Law enforcement officials need to know how to prevent tobacco sales to youths, but also how to use tools and resources already available from community organizations like Project ASSIST, North Carolinians for Tobacco Free Kids, the NC Department of Human Resources' Substance Abuse Prevention Branch, and the NC Tri-Agency Council (American Heart Association, American Lung Association of NC and American Cancer Society, NC Division). These organizations can help educate both merchants and youths, build support for stronger legislation, and support enforcement efforts. Increased interaction between law enforcement and the community can heighten community awareness of the prevalence and problems of teenage tobacco use and lead to more active enforcement of the law.[15]

Since 1891, it has been illegal in North Carolina to sell tobacco products to persons less than 17 years of age. In 1991, the age limit was raised to 18, but an amendment making it illegal only to "knowingly" sell tobacco products to minors rendered the law essentially unenforceable. Two years later health advocates attempted to strengthen the law by removing the word "knowingly" and requiring identification checks, but their efforts were unsuccessful.

Table 1. Barriers to enforcement of NC's youth access to tobacco law

Lack of manpower	54%
Poorly written law	39%
Lack of time	35%
Lack of funding	31%
Lack of interest	30%
Lack of administrative support	28%
Lack of community support	27%
Lack of support from district attorney	19%
Department policies	5%
Other	17%

Table 2. Percentage of NC law enforcement officers who support strengthening NC's youth access to tobacco law

Restrict vending machines	96%
Remove "knowingly" from law	86%
License retail merchants	84%
Allocate state funds	77%
Check ID of all purchasers <30	76%

In 1995, the tobacco industry sponsored a bill that retained the word "knowingly" but required retailers to check the age of all prospective purchasers whom the seller had "reasonable grounds" to believe were less than 18 years old (GS 14-313). There were penalties for minors who purchased, attempted to purchase, or received tobacco products, and for attempting to use false identification to purchase tobacco products. However, the law included a preemption clause prohibiting local governments from regulating the sale, distribution, or promotion of tobacco products except through vending machines.[16] No local authority could enact a law more restrictive than one passed by the General Assembly. GS 14-313 did not effectively reduce the number of merchants who illegally sold tobacco products or the number of minors who smoked.

> "Licensing identifies retailers who sell tobacco products, thereby enabling law enforcement to target educational and enforcement activities and track repeat offenders."

Eighty-four percent of the officers who responded to our survey believed that GS 14-313 reduced only slightly or not at all the number of merchants who illegally sold tobacco products to minors. Officers strongly supported strengthening the language of the law, stricter identification policies, restricting vending machines to locations not readily accessible to minors, the licensing of all retailers that sell tobacco products, and allocating state funds for enforcement (Table 2).

A retail licensing program is essential to any comprehensive plan to reduce youth access to tobacco. Licensing is part of the model law proposed by the Department of Health and Human Services and is endorsed by most studies of youth access interventions.[3,13,17] Licensing identifies retailers who sell tobacco products, thereby enabling law enforcement to target educational and enforcement activities and track repeat offenders. Moreover, licensing creates a strong disincentive against illegally selling tobacco products. Without licensing, fines for illegal sales may be regarded as just the "cost of doing business," but revoking the license of a merchant who illegally sells to a minor means loss of the ability to sell tobacco legally to adults. Licensing incorporates the merchant in enforcement and creates a strong incentive for merchants to monitor themselves.[3] Finally, licensing provides a source of potential funds for enforcement activities. Without funds, departments cannot run educational or enforcement activities or support outreach programs. Money from licensing of retail merchants (or state-allocated funds) could help law enforcement overcome lack of funding and lack of manpower, two of the major barriers to enforcement identified by the officers (Table 1).

In the 1997 NC General Assembly session, North Carolina's youth access to tobacco law (GS 14-313) was significantly strengthened. However, neither licensing nor state allocation of funds were included. Major changes to the law were: requiring photo ID as proof of age, removing the word "knowingly" regarding sales, posting a sign near the point of sale stating that North Carolina prohibits the purchase of tobacco products by minors, training employees about the law, imposing penalties for use of a false ID to purchase tobacco, restricting vending machines to adult-only locations or operating them with tokens or locking devices, and banning all out-of-package sales.[18,19] Moreover, the changes strengthen GS 14-313, but by themselves will not decrease youth buy rates.

Without active enforcement efforts, North Carolina is unlikely to significantly reduce youth access to tobacco or achieve the required 80% merchant compliance rate required by the Public Health Service Act, possibly jeopardizing 40% of the state's Substance Abuse Prevention and Treatment (SAPT) Block Grant. A 40% noncompliance penalty would reduce the 1996-7 SAPT Block Grant by approximately $10 million.[10]

In 1996, after intensive investigation of tobacco products and the tobacco industry, the Food and Drug Administration (FDA) regulated the sale and distribution of cigarettes and smokeless tobacco to minors. The regulations make the sale of cigarettes and smokeless tobacco to persons less than age 18 a federal violation and require manufacturers, distributors, and retailers to comply with conditions regarding the sale, distribution, and promotion of tobacco products.[20] The FDA plans to contract with state and local law enforcement agencies to actively enforce their regulations. Their goal is to have contracts in place with all 50 states.

> "In the 1997 NC General Assembly session, North Carolina's youth access to tobacco law (GS 14-313) was significantly strengthened. However, neither licensing nor state allocation of funds were included."

Responsibility for enforcing North Carolina's youth access to tobacco law rests with local law enforcement. These officers are best served by a strong state law that sends a clear message to communities that North Carolina stands firmly against tobacco use by minors, that the protection of youths from tobacco use is an important cause, which demands time, effort, and support from law officers and their communities. With the appropriate resources, North Carolina's law officers appear ready and willing to enforce the youth access to tobacco law and help prevent youth tobacco addiction. ❑

Acknowledgments:

The authors thank Lt. Christopher Hoina of the Cary Police Department for organizing the training conferences and helping design the questionnaire, and David Altman, PhD, for advice and assistance.

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The Role of the Medical Profession in a Managed Care Environment

Statement of the Bioethics Committee of the North Carolina Medical Society

Editor's note: At the annual meeting of the North Carolina Medical Society in Pinehurst in November, the Bioethics Committee introduced a resolution that would require the Society to take a specific position relative to the practice of medicine in the present era of third-party payment for and influence over medical care. This proposal engendered considerable debate—and heated argument—both in the Reference Committee and in the House of Delegates. The final decision of the House was to file the motion, effectively removing it from action.

It is the opinion of the Editor that this statement offers much of value for doctors to ponder. It is worth more reflection than a motion "to file." If the unexamined life is not worth living, the unexamined practice is not worth practicing. The resolution put forth by the Bioethics Committee asks us to look at the distortions introduced into the doctor-patient relationship by the ancient principle that he who pays the piper calls the tune. Doctors often [are forced to] turn for guidance in medical decisions to the insurance companies (or health maintenance organizations) who pay for their services. Patients, insulated from the need to pay directly for services, undervalue the advice that doctors have to offer.

In order to foster further discussion, the *Journal* showed the slightly edited version of the resolution printed below to a number of physicians for comment. Several declined to respond. We print responses we did receive here. We invite readers to offer their comments in writing or via electronic mail (yohn0001@mc.duke.edu).

Resolved, That the North Carolina Medical Society adopt as policy the following statement on the medical profession's role in a managed care environment:

I. Origin of the problem. We believe that most of the current problems in medical care delivery originate from the introduction of insurance as a method of payment for medical care services. Because everyone welcomed this "innovation" as the solution to payment concerns, all believed that they would benefit from this change. Therefore, all parties—physicians, patients, and payors—are responsible for this ultimately unwelcome state of affairs. Each member of this "triangular relationship"—physician, patient, and payor—has nurtured this original insurance concept for his or her own benefit, and gradually transmogrified it into paying for medical care with "other people's money" or "getting something for nothing" with disastrous consequences.

II. Current state of the managed care environment. Presently, because of the desire that insurance pay for all medical needs and other distortions in our economic system, each member of the triangular relationship has lost control over many of the benefits and responsibilities of the simpler "one-on-one" system. Patients frequently lose the choice of hospital, physician, or provider, and procedures that they believe are needed. Payors lose control of costs. And physicians, caught in a disingenuous and coercive system and manipulated by gag clauses, capitation, withholds, and "risk-sharing agreements," lose the most precious possession of their once noble profession: the public trust in them as caregivers, confidants, and advocates.

III. Our professional objectives. It is the obligation of the profession of medicine to preserve the integrity of the institution of "physicianhood" and the role of the physician as caregiver, confidant, and advocate for the individual patient. This, above all other responsibilities, must be the foundation upon which medical societies and individual physicians base their recommendations and policies in areas of medical care reform. Whatever damages, or may damage, this sacred function should be opposed and actively resisted at all levels of medical leadership regardless of the potential for conflict.

IV. What we must do. To preserve the profession and its social mission, it is the recommendation of the Bioethics Committee that the North Carolina Medical Society promote a resurgence of patient control over choice in medical care and reaffirm the trust in the physician-patient relationship by promoting and implementing wherever possible a system wherein patients must exchange something of value for the services (except those required by medical catastrophe) they receive in the medical marketplace. In addition, the Bioethics Committee recommends that this Society actively promote catastrophic medical insurance as the most moral and just method of managing infrequent, high-cost medical expenses.

It is the belief of the Bioethics Committee that the field of medical care reform is too expansive to "solve" with a few suggestions. We also believe, however, that the following fundamental principles will mollify much of the social upheaval resulting from current medical reform efforts:

1) The patient must regain control of the cost and quality of medical care. This can be accomplished by the exchange of something of mutually agreed upon value between patient and physician for care received.
2) The cost of medical care may, on occasion, exceed the resources of the individual patient. This circumstance should be addressed by a system of catastrophic medical insurance.
3) Physicians are obligated to continue their tradition of providing care to those who cannot afford it.

We believe that these fundamental principles will establish a foundation upon which to rebuild a medical care delivery system that is fair, equitable, and just. ☐

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Comment *by Phil Sellers MD*

I have been deeply involved in our local managed care arena for a number of years. I have serious questions about the ethics of managed care and its negative effects on patients as well as on the medical profession.

Rationing health care by cost has been going on since the beginning of time. Today, health insurance permits care for many people who, without that insurance, would not receive care. In many cases, physicians could not provide reasonable health care without insurance payment. One problem is that people assume they have a right to health insurance and take it for granted.

Many observers saw the recent double-digit yearly rises in health care costs as the biggest problem plaguing our health care system. Managed care attenuated that problem, but it negatively changed the physician's professional role in the doctor-patient relationship—managed care companies make patient care decisions, and in capitated systems physicians are expected to do less in order to preserve income.

The three principles promoted by the North Carolina Medical Society's Bioethics Committee as a means of maintaining the optimum doctor-patient relationship are idealistic, but we don't live in an ideal world. Our health care system continues to change in regard to high health care costs, increased patient expectations and demands for decision-making (brought about in part by health care information on the Internet), new technology, and expanding beneficial treatments ranging from drugs to treat toenail fungus to bone marrow transplants for metastatic carcinoma of the breast.

I offer the following comments on the Committee's three principles:

1. Ideally, patients should be in control and should exchange something of value in return for physician care. But consider the patient who goes to the emergency room with chest pain, sees or has something done by five or six different doctors, and has multiple high-cost tests for what turns out to be transient esophageal spasm. How will the patient have any control in such a scenario?

2. Catastrophic insurance may work for high-ticket items like surgery, but I don't believe it would work for low-ticket items like office visits and prothrombin time measurements. Patients who had only catastrophic insurance would not receive services they need. Patients now have copayments and deductibles, which are going up as employers try to reduce their health care costs; if the size of copayments and deductibles were to rise rapidly, the situation would become similar to catastrophic insurance. Already many physicians and upper-income individuals use catastrophic insurance as their only health insurance coverage. For such individuals, Medical Saving Accounts would provide funds for health services.

3. Most physicians do give free care and will continue to do so. But without insurance coverage, even free care may not be reasonable care for patients on Medicaid or those who attend community health and rural health care clinics.

As we enter the 21st century, I believe that the health care industry will continue to grow and that people will continue to be fascinated with health and disease. Given that, I think that the Committee's principles represent lofty ideals, but I don't think they can be applied realistically without hurting too many people. I worry about other things, too. I worry that the government may soon step in and dictate who gets what in the health care system. And I feel the doctor-patient relationship is being tarnished by some present-day practices. It makes me sad that by trying to work with managed care, I may be part of the problem! What can you or I do? We must continue to make our patients' welfare our first priority. We must retain our role as decision-makers for our patients as we work with managed care. Physician Sponsored Organizations (PSOs) may enhance our ability to remain in control for our patients in the present climate.

Dr. Sellers is President, Henderson County Medical Network, and an internist in Hendersonville.

Continued

Comment *by Darlyne Menscer, MD*

Recommendations from the NCMS's Bioethics Committee generally have been well received by the Society's reference committees and on the floor of the House of Delegates. Why, one may ask, did this one fail to receive even the courtesy of a reconsideration?

The original version of this statement contained somewhat more volatile language, which may have turned some physicians off before they had a chance to read it carefully and consider its merits. But even in this version, it is obvious to those who have read documents previously produced by the Bioethics Committee that this document had not received the usual careful review.

In fact, the subcommittee that produced the original document did not include ethicists and other consultants who have contributed immeasurably to the Committee's work in the past. Even the full Committee never met together to debate it. The document did "pass" a faxed yes or no vote—permitting it to be called the "work" of the Bioethics Committee—but the Reference Committee and the House were right to find it wanting and reject this document.

In fact, the NCMS does have policy on the ethics of managed care. Readers can request a copy of the document, known as "Report QQ: Ethics in Managed Care," from the Medical Society (222 N. Person St., P.O. Box 27167, Raleigh 27611-7167, 800/722-1350). This document is much better written and seems sufficient to me.

Dr. Menscer is a member of the NCMS Bioethics Committee and is a physician with the Department of Family Practice, Carolinas Medical Center, Charlotte.

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Comment *by John Glasson, MD*

I support the decision of the Society's House of Delegates to "file" the resolution introduced by the Bioethics Committee, effectively removing it from action. I believe that this resolution, as written, should not be adopted by the Medical Society; however, this thoughtful and provocative statement by the Bioethics Committee raises many issues for our consideration. I agree with the resolution's statements about physician responsibilities and some of the consequences of our current managed care environment:

- Physicians must place the best interests of their patients first under all circumstances—even above their own self interests. This is in agreement with AMA and Medical Society policy outlined by the Council on Ethical and Judicial Affairs in their report titled "Ethical Issues in Managed Care" (January, 1995).
- Physicians must share in the care of the poor, as detailed in the AMA Code of Medical Ethics (Section 9.065 1996-7).
- The managed care cost-containment strategies often used by insurance companies have the potential of endangering the public trust in physicians as caregivers, confidants, and advocates.
- The current system of medical insurance can insulate patients from knowledge of or concern about the costs of care.

The Bioethics Committee asked the Medical Society to adopt as policy the position that insurance for medical care services beyond catastrophic coverage is immoral, disingenuous, and coercive. I believe that this position is radical, and that the complete abolition of insurance beyond catastrophic coverage would not produce the desired results of increased patient control of cost and quality of medical care.

The resolution correctly implies that catastrophic insurance coverage with large, up-front deductibles can afford the policy-holder more choices of physician caregivers and hospitals and more knowledge and concern about the cost of medical care. However, the report fails to define catastrophic insurance coverage. That definition may vary among individuals and groups, depending on their ability to produce "something of value" needed to pay for care received (that is, fee for service).

For a large majority of the populace, medical care insurance provides necessary protection against possible unexpected high-cost medical care in the future. Medical insurance is an essential element of government programs for the poor and aged. It is also highly sought by employees as a benefit of full-time employment. Only the exceptional person has the financial freedom to purchase medical insurance with a high deductible and pay "out of pocket" for noncatastrophic medical costs.

Physicians, working with employers and health plans, can improve the quality of care while containing costs. Disease management and demand management are new approaches that contain costs while maintaining high-quality medical care. Disease management uses clinical practice guidelines or parameters and outcome studies to coordinate medical care across the entire delivery system. Demand management allows employers and health plans to reduce utilization and costs of health care through disease prevention, health promotion, and access management activities.

I do not believe that there is a one-size-fits-all solution to address the issues of cost-containment and quality of care. We, as professionals, must actively address these issues. Continuous involvement is necessary because of the rapidly changing dynamics of the health care environment. Rather than abandoning medical care insurance as we know it, I believe that we should work toward the custom design of medical insurance policies to meet the special needs of the insured. Physicians should take the lead in examining and refining managed care cost-saving provisions in order to preserve the best possible relationships between physicians and patients.

The Bioethics Committee's resolution raises issues that are worthy of consideration. Although I support the Medical Society's position regarding this resolution, I believe that we must continue to be involved in processes that support and ensure quality medical care. We can demonstrate a continued commitment to cost-containment and quality medical care by reexamining our role as physicians in the current managed care environment.

Dr. Glasson is immediate past chair, AMA Council on Ethical and Judicial Affairs, and retired orthopedic surgeon, Durham.

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Comment *by Samuel M. Atkinson, Jr., MD*

The Editor's note suggests that by the actions of the House of Delegates we did not "ponder" the resolution from the Bioethics Committee. This resolution was debated at Executive Council where essentially all members felt it was, in its form, unacceptable—not that any one of us on the Council wasn't just as frustrated as is the Bioethics Committee. It was finally forwarded to the House of Delegates without a recommendation from Council and was debated in Reference Committee III.

The Reference Committee listened ad nauseam to many frustrated physicians. The Reference Committee, in its independent wisdom, concluded, as had the Council, that this resolution with all its good intentions would not, in its form, accomplish anything useful. Parliamentary procedure allowed this resolution to come forward, to be debated in the Reference Committee, and ultimately voted down by the House of Delegates.

Surely the Bioethics Committee can construct a resolution that, while deploring the current state of affairs, offers responsible alternatives that are short of an unreasonable return to the 1930s. I know of no resolution that has been more thoroughly discussed and soundly defeated. I infer from the Editor's note that the Editor does not feel this resolution received a "considered discussion" by the House of Delegates. Parliamentary procedure gave this resolution a "considered discussion" in the House of Delegates and allowed a democratic solution. We cannot realistically achieve change by refusing to accept anything but catastrophic insurance or "...exchanging something of value for the care received."

Our patients will correct the perceived injustices if we don't refuse them care or refuse to help them with their reimbursements. Citizens are already rebelling against managed care. The tidal wave from the West Coast is receding. We must be part of the solution, not long for a return to 1963. Perhaps the Bioethics Committee should have demanded the formation of a labor union so that we could truly and collectively bargain for and with our patients for the care the Bioethics Committee rightly desires. But then, as Steve Anderson stated when he was president of the NC Ob/Gyn Society "Opposing attorneys get along better than consulting physicians." Labor union members get along better at times than do members of our NCMS.

The problems are well stated. The solutions suggested are not acceptable. The House of Delegates has spoken.

Dr. Atkinson is Professor, Department of Obstetrics and Gynecology, East Carolina University School of Medicine, Greenville.

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Comment *by Carol Kirschenbaum, MD*

The resolution from the Bioethics Committee reflects the growing frustration of physicians dealing with the current incarnation of medical insurance—the profit-driven health maintenance organization (HMO). The profit motives of these institutions undermine the provision of health care. The North Carolina Ad Hoc Committee to Defend Health Care is part of a national movement to halt, on ethical grounds, the for-profit takeover of health care and to speak up for health care as a right.

Medical insurance, in its original form, allowed the well and the chronically ill, the wealthy and the poor—that is, society as a whole—to share the costs of health care. It sought to protect patients from medical and financial disaster. Traditionally, the revenues from insured patients helped subsidize the care of those who could not pay. This situation has changed because for-profit corporations have been far less responsive to community needs than their not-for-profit counterparts (although competition has made not-for-profits behave more and more like for-profits). Now, when conflicts arise between quality care and profit, CEOs and boards of directors are legally obligated to resolve that conflict in favor of shareholder profit. Dr. Linda Peeno, a former HMO medical reviewer recently testified that repeated denials of tests, procedures or referrals are intentionally used to enhance corporate profits.

The Ad Hoc Committee does not call for a return to the failed system of the past when a small number of physicians abused reimbursement arrangements for personal profit and financial incentives encouraged other physicians and hospitals to provide unnecessary treatment. This contributed to an astounding escalation of health care costs, and allowed medical care administrators to take increasing control of the medical system.

Today the fee-for-service system has been replaced by a "fee-for-non-service" system. Physicians are rewarded for denying care, and not surprisingly, physician-patient trust has plummeted. In the pursuit of corporate profits, physicians are explicitly rewarded for shunning the sickest. Skilled clinicians care with dedication for significantly ill patients only to be removed from approved provider lists because they cost the corporation too much money.

Corporate-driven health care has exacerbated the chronic problems with access to care. Managed care companies have reduced payments so much that hospitals and doctors find it increasingly difficult to provide uncompensated care. In markets with high managed care penetration reductions in such care by as much as 36% are seen.[1] Diverting 20%-30% of resources away from health care to finance administrative, marketing, and stockholder pay-outs cannot increase access or correct past abuses. "Patient dumping" from emergency rooms has increased under for-profit managed care.[2] Patchwork solutions to the problem of lack of insurance—like the Health Insurance Portability and Accountability Act (known as the Kennedy-Kassenbaum Bill)—are also proving to be ineffective.

The intrusion of new levels of managers into the health care system means that professional organizations have lost the power to determine health care standards. Deprofessionalizing and downsizing compromise care, and have drastically effected the nursing profession in particular. American medicine has long been community-based and grounded in a deeply-rooted Samaritan tradition. We must reframe the terms of the health care debate to reject a system in which corporate profits, not quality and patients' well-being, come first. We need to renew a coherent moral debate of how to implement health care rights relative to competing rights and critical social resources. Decisions about health care expenses may be difficult, but they must not be left to corporate minions, meeting in private boardrooms, who stand to gain the most by providing the least.

The following principles can serve as a basis for a national health care debate:[3]

1. Medicine and nursing must not be diverted from their primary tasks: the relief of suffering, the prevention and treatment of illness, and the promotion of health. The efficient deployment of resources is critical, but must not detract from these goals.
2. Pursuit of corporate profit and personal fortune have no place in caregiving.
3. Financial incentives that reward overcare or undercare weaken physician-patient trust, and should be prohibited. Similarly, business arrangements giving the power to control patient care decisions to employers, administrators, and corporate executives rather than to health care professionals are unacceptable and should be proscribed.
4. The right of all patients to consult a health care provider of their choice must not be curtailed.
5. The right to health care must be universal.
6. Financing of health care should be made accountable to the public, not to Wall Street.

The Ad Hoc Committee to Defend Health Care urges physicians and other health care professionals to call for the elimination of for-profit corporations from health care and for the restoration of professional power and autonomy to manage patient care. A first step would be a legislative moratorium on for-profit takeovers of hospitals, insurance plans, HMOs, physicians' practices, and other health care institutions.

We believe that it is possible to design comprehensive ways to provide universal access and control costs without undermining the professional quality of care. This will require more than just catastrophic medical insurance, which does not address preventive care and may not keep patients with chronic illness from exceeding their resources. The Ad Hoc Committee does not endorse a specified program for health care. A number of solutions might honor the six points listed above and return medicine to its roots of compassion, healing, and trust. It is time for physicians to enter into earnest public discussion about the future of health care in this nation.

Carol Kirschenbaum, MD, is an Internist in Durham, and a founding member of the Ad Hoc Committee to Defend Health Care. She acknowledges Wes Wallace, MD, and other committee members for their helpful suggestions. Physicians interested in more information about the Committee may write to NC Ad Hoc Committee, 306 Monticello Ave., Durham, NC 27707.

Editor's note: *For more discussion on this topic, turn back to Letters to the Editor, page 72.*

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FOR PATIENTS

NORTH CAROLINA MEDICAL SOCIETY

Health Watch

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Spinal Surgery

"CAGE" TECHNOLOGY REVOLUTIONIZES APPROACH TO SPINAL FUSION SURGERY

William F. Lestini, MD

"Cage" technology, coupled with such advances as the laparoscope, is revolutionizing the approach to spinal fusion surgery. The truth is, there are few human conditions more painful and debilitating — or more common — than acute and chronic back pain resulting from a herniated, collapsed, or degenerative disk. Now, we have minimally invasive surgical options to offer patients that represent dramatic improvements over traditional procedures of the past.

When Vertebrae Scrape

What happens in the process is pretty straightforward. Between each pair of vertebrae is a disk that cushions the spinal column. When a disk degenerates, the vertebrae begin scraping against one another, causing severe pain. To relieve the pain, the surgeon's job is to remove the disk and attempt to fuse the affected vertebrae together.

Dr. Lestini is an orthopaedic surgeon at Triangle Spine and Back Care Center, 3320 Wake Forest Road, Raleigh 27609.

In the traditional procedure, called a posterior fusion, surgeons cut through the thick musculature of the back and, in most cases, attach pedicle screws or rods to the spine, seeking stability. Rehabilitation after the posterior fusion is lengthy; it takes about a year to get the involved muscles stabilized post-operatively. And then it takes another year or two after that to return those muscles to near-normal strength. The scarred muscles and nerves are never really normal again after extensive posterior surgery. The new surgical procedure presents a markedly different picture, for the operation itself and for recovery.

Titanium Cages

At the heart of the new surgical technique are small, hollow, extremely strong titanium fusion cages that are implanted between the affected vertebrae (see photos). Use of these cages has been rigorously tested over the past several years, with notable success.

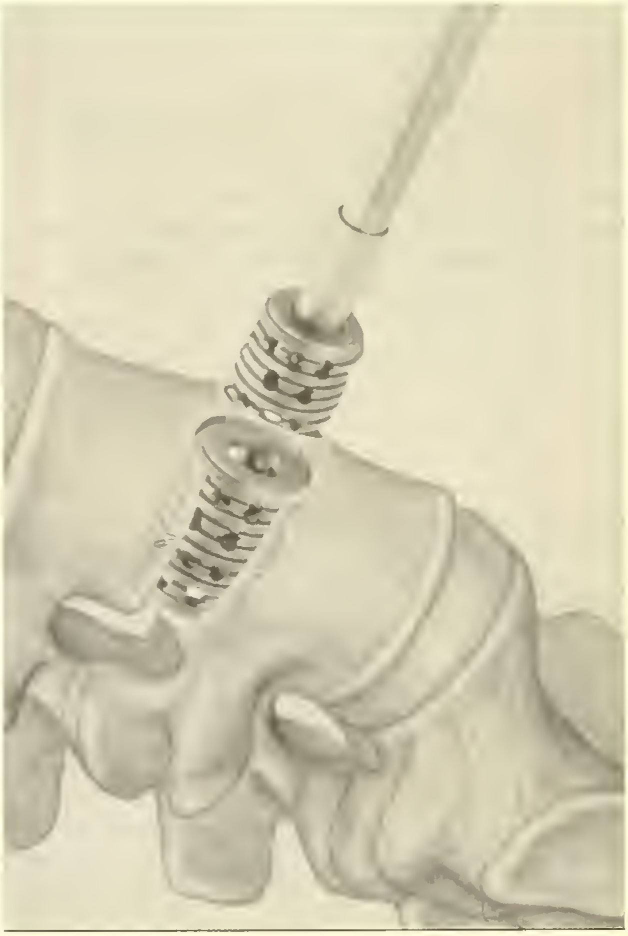
Recently, Triangle Spine and Back Care Center in Raleigh, NC, was tapped as one of a dozen sites in the country (the only one in North Carolina) to conduct FDA clinical trials of a new type of fusion cage, intended specifically for use with the laparoscope. The procedure is called Instrumented Laparoscopic Spinal Fusion (ILSF). We have received extensive training in implantation techniques for this new type of surgery.

During ILSF, the surgeon makes tiny incisions in the patient's abdomen and inserts a laparoscope, a pencil-thin camera that allows the surgeon to see the internal anatomy on a video screen. The cage, which can also be inserted through a small, open incision in the abdomen, is packed with the patient's bone — harvested in very small quantity from the hip.

The damaged disk is removed and stabilized with the cages. The important back muscles and nerves are not harmed in any way. They are left intact and unscarred. The bone graft grows through the hollow cages, providing long-term stability. The idea is to put bone in and around the joint to stop the joint from pinching nerves and causing pain. The cages stabilize the spine and protect the bone graft until the graft fuses. Cages provide the same degree of stability as the posterior screws, plates, and rods, without the soft-tissue trauma of the posterior approach. It is a minimally-invasive procedure with no muscle loss, compared with the traditional procedure, which involves six- to eight-inch incisions and very long recovery time.

The cage procedure — with a small, open incision — is as successful as the laparoscopic technique, and it has had Federal Drug Administration (FDA) approval for some time. Studies show about a 98% fusion rate with the one-level cage device and more than 90% fusion with the two-level device — when two disks are involved. These are really excellent results, in a group of patients with complicated, serious problems.

With the cage technology, patients return to work in four to six weeks, as compared with four to six months following posterior fusions. Hospital stays are usually no more than two days, compared with about a week for the traditional procedure, and the cost for the new technique is about $9,000 less than the posterior fusion. For more information about the treatment of spinal pain and disorders, contact your physician.



Summary at a glance:

The Interbody Fusion Device System

The interbody fusion device system is an innovative series of FDA-approved spinal implants, surgical instruments, and procedures that assist the surgical placement of implants between the vertebrae to stabilize the spine and facilitate the fusion of the vertebrae.

A newly developed "cage" is also being used. These cages are the only such devices that can be inserted laparoscopically. Both devices help reduce the spinal instability that can cause chronic disabling back pain.

Innovative, Comprehensive Systems

The new systems facilitate fusion of spinal vertebrae in three areas of the spine: the lower, or lumbar spine; the neck, or upper spine; and the chest regions of the spine. Degenerative disc disease occurs most often in the lumbar region.

The interbody fusion system includes spinal implants, customized surgical instruments, and techniques that facilitate the surgical placement of the implants. The fusion implants are hollow, threaded cylinders, or "cages," implanted between two or more vertebrae. The cages are packed with bone graft to facilitate the growth of the vertebral bones through holes in the cylinder. Fusion is achieved when adjoining vertebrae grow together through the implant.

Improvements Over Traditional Techniques

Less patient trauma

Surgery can be performed using less invasive or laparoscopic procedures. There are smaller incisions, less blood loss, and less post-operative pain.

Reduced operating time

Cages can be implanted in less time than conventional procedures, further reducing patient trauma and operating room costs.

Shorter hospitalizations and speedier recovery

Cage procedures may reduce patient hospital stays, and in some cases, the procedure is performed laparoscopically on an outpatient basis. Rehabilitation and recovery time is much shorter than with traditional techniques.

Reduced costs

Total cost for interbody fusion procedures is substantially less ($7-9,000) than traditional fusion procedures with implants.

Greater stability

New devices cause less irritation and scarring of the nerves and muscles.

Degenerative Disk Disease and Traditional Treatments

What Is Degenerative Disc Disease?

Between each of the 24 vertebrae of the human spine is a vertebral disc comprised of cartilage-like materials that separate the vertebrae and allow flexible movement. Injury, aging, or repeated stress can produce degenerative disc disease, or a collapse of the disc, which can lead to excessive motion in the spine, inflammation of the nerves in and around the spine, nerve dysfunction, and severe, debilitating pain in the back, arms, or legs.

What are the Costs?

In the United States, back pain is the leading cause of workers' compensation expense; it is the second leading cause of physician office visits, and the third leading reason for surgical procedures.

> **80% of the population will, at one point, have some spinal problem.**
>
> **Back pain affects 12 million people — most of them between the ages of 20 and 60 — during their most productive years, and it is the leading cause of medical expense for this age group.**
>
> **The annual direct medical cost of treatment of back pain exceeds an estimated $25 billion; the indirect costs of lost worker productivity is an estimated $60 billion.**
>
> **More than five-million Americans are disabled due to chronic back pain; within this group, more than 2.6-million are permanently disabled.**

Traditional Back Pain Treatments

Invasive Back Surgery

The most commonly performed surgical interventions for chronic back pain are discectomy and vertebral fusions.

Discectomy

Discectomy is the most commonly performed spinal procedure — in fact, more than 400,000 discectomies were performed in 1994. This procedure is typically intended to treat hip, leg, or back pain or nerve dysfunction. It involves the surgical removal of herniated disc material through an incision usually made in the patient's back. Because a herniated disc may be evidence of degenerative disc disease, patients requiring discectomy are at higher risk of needing additional spinal surgery.

Vertebral fusion

Vertebral fusion helps eliminate spinal instability by fusing adjoining vertebrae. It involves the surgical implantation of bone graft into or around the disc space. The grafted bone fuses the vertebrae together over a period of several months. Typically, the implanted bone is harvested from the patient's hip.

There are two types of spinal fusion surgery: non-instrumented, without use of implants, and instrumented, with implants. Clinical analyses have demonstrated that spinal fusion surgery in the lumbar (lower) spine using spinal implants is more effective at providing structure and rigidity to the spine than surgery without implants. Instrumented fusion involves the surgical attachment of a metal implant to the vertebrae adjoining one or more diseased discs through an incision in the patient's back or abdomen.

Minimally Invasive Surgery

To date, most fusion procedures have been performed through a large incision in the patient's back. Increasingly, procedures are being performed using minimally invasive tools and techniques which helps reduce the surgical trauma associated with incisions through the skin and muscles.

Laparoscopic surgery and minimally invasive anterior techniques involve small incisions or punctures in the skin and muscle, allowing patients speedier recovery time, shorter hospital stays, and faster return to work. ❑

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How Do North Carolina Prenatal Care Providers Counsel and Test Pregnant Women for HIV?

Survey Measures Knowledge of HIV Testing Benefits

Emmanuel B. Walter, MD, MPH, Margaret A. Lampe, RN, Elizabeth Livingston, MD, and Rachel A. Royce, PhD, MPH

It has been nearly four years since the results of the AIDS Clinical Trial Group Protocol 076 were published.[1,2] This double-blind, placebo-controlled trial demonstrated that administration of zidovudine (ZDV; formerly called azidothymidine or AZT) to a selected group of human immunodeficiency virus (HIV)-infected pregnant women and their newborns after delivery reduced by two-thirds the risk of vertical transmission of HIV to their infants. Subsequently, the state of North Carolina documented a statewide decrease in the rate of perinatal transmission of HIV that was ascribed to the use of ZDV.[3] Reducing perinatal HIV transmission with ZDV depends on the woman receiving prenatal care and having her HIV infection status determined during pregnancy. This means that it is the responsibility of prenatal care providers to offer HIV testing and providing counseling to pregnant women. It also means that providers are responsible for offering ZDV (or other antiretroviral therapy if indicated) to pregnant women infected with HIV.

In 1994, the US Public Health Service recommended that all HIV-infected pregnant women be treated with ZDV.[4] (In 1995, a second set of guidelines recommended universal HIV counseling and voluntary testing of all pregnant women.[5]) In 1994, the NC health director sent a letter to prenatal care providers urging them to "strongly encourage HIV testing" of all pregnant patients. In August 1995, the state code of North Carolina was amended to recommend that every pregnant woman in North Carolina have HIV pre-test counseling by her attending physician as early in the pregnancy as possible, and at the same time, be encouraged to be tested for HIV. If informed consent is given, the attending physician should test the woman as early in the pregnancy as possible.[6]

Because of the central role prenatal care providers play in perinatal HIV prevention, we sought to describe actual practices relating to HIV counseling and testing of pregnant women and the management of HIV-infected women. We conducted a statewide mail survey of prenatal care providers in July 1995, just before the revised North Carolina code was issued. We sought to determine whether prenatal care providers knew about the health advantages of testing and the benefits of treating infected pregnant women.

Methods

In July 1995, we mailed an anonymous, 68-item, self-administered questionnaire to a cross-section of 1010 NC prenatal care providers registered with the NC Board of Medical Examiners as of October 1994, or the NC Board of Nursing as of February 1995. We assessed current practice related to HIV counseling and testing of pregnant women and to the management of HIV-infected pregnant women. We used a one-time mailing with no attempt at follow-up. A $1 incentive and a return address, postage-paid envelope were included with the survey. Providers were asked to complete the survey only if they provided prenatal or obstetrical care.

Study population. The surveyed providers represented 613 obstetrician/gynecologists (ob/gyns), including residents; 173

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family practitioners providing obstetrical care; 79 certified nurse midwives; and 145 ob-gyn nurse practitioners.

Study variables. We collected descriptive demographic information about the provider (gender, race/ethnicity, years in clinical practice, practitioner type) and information about their clinical practice (practice setting, practice location, and health insurance status of the patients served). Questionnaire items were structured and respondents were asked to choose the most appropriate response. The survey items assessed current practices for HIV counseling and testing of pregnant women, and current and past practices regarding care for HIV-infected pregnant women. Providers were asked to choose which of a list of 15 potential risk factors for acquiring HIV infection should be used in recommending that a prenatal or obstetrical patient receive HIV testing. Listed among those choices was "no identifiable risks for HIV infection."

Data analysis. Frequency of response was calculated for each questionnaire item. Items related to HIV counseling and testing of pregnant women and to the care of HIV-infected pregnant women were analyzed to determine whether they were associated with demographic variables or the setting in which the provider practiced. Differences between and among groups were assessed using the Pearson chi-square test. All analyses were conducted using JMP® [Version 3: SAS Institute, Inc., Cary, NC].

Results

Of the 1010 surveys mailed to NC prenatal care providers, 594 (59%) were answered and returned and 103 (10%) were returned unopened as undeliverable. The response proportion among the 907 providers who received the survey was 66%. Response rates varied by type of practitioner; 51% of ob/gyns, 32% of family practitioners providing obstetrical care, 86% of certified nurse midwives, and 52% of ob/gyn nurse practitioners responded.

Of the 594 providers who returned the survey, 511 identified themselves as providing prenatal or obstetrical care; the remaining 83 were declared ineligible and were excluded from analysis. Table 1, at right, shows demographic and clinical practice information relating to the 511 providers who returned a completed survey.

Table 2, next page, presents responses to selected survey items describing HIV counseling and testing practices and care of HIV-infected women. More than 95% of the respondents said that they are able to provide an HIV test directly or through their practice, and 93% said that all pregnant women should be offered testing for HIV regardless of stated risk behavior. In most cases, HIV counseling and testing were offered at the first prenatal visit. Of providers who reported having testing opportunities available through their practice, 82% said that they had a policy to offer HIV testing to all patients, but only 67% actually offered HIV antibody testing to all. More than half of all providers responding to the survey believed that HIV antibody testing should be mandatory during pregnancy.

Providers varied in their recommendations for HIV testing of prenatal or obstetrical patients with various risk factors. More than 95% of respondents recommended testing women who directly requested it or who reported sexual contact with an HIV-infected partner, sexual contact with an injection drug user, sexual contact with a bisexual male, sexual contact in return for money or drugs, a personal history of injection drug use, or a history of rape or sexual assault. Over 90% of providers recommend testing women with a history of multiple sexual partners or of a sexually transmitted disease. Between 80%-90% of providers recommend HIV testing of women who had blood transfusions before 1985 or those with occupational exposure to HIV. Between 75%-80% of providers recommend testing women with a history of alcohol abuse and those living in areas of high HIV prevalence. Although 94% of providers

Table 1. Descriptive demographic information about 511 providers' clinical practices

		N*
Gender	male	282
	female	226
Race/ethnicity	white	463
	black	29
	other	17
Years in practice	≤10	233
	>10	270
Type of practitioner	ob/gyns	310
	family practitioners	55
	nurse-midwives	68
	ob/gyn nurse practitioners	75
Type of practice	private practice/clinic/HMO	353
	tertiary care center	96
	public health dept.	54
Geographic location	urban/suburban	295
	rural/small town	212
Insurance	>50% public funding, self-pay, no ability to pay	203
	>50% private insurance/HMO	204
	no predominant insurance status	95

* Numbers do not always total 511 because of missing data

Table 2. Response percentages of 511 NC prenatal/obstetrical care providers regarding HIV counseling and testing or pregnant women and care for HIV-infected pregnant women*

	Yes	No
1) Are there HIV testing opportunities for pregnant women through your practice?	96	3

If Yes to #1 (n=491),

	1st prenatal visit	subsequent visits	delivery/ppartum.
2) Counseling and testing are primarily offered at:	92	13	3

	patient request	policy to offer testing to all patients	your risk assessment
3) Testing is primarily based on:	8	82	9

	0	1-25	26-50	51-75	76-99	100
4) HIV antibody testing is offered to approx. this % of women you see for prenatal care	2	11	2	3	13	67

	strongly agree	agree	disagree	strongly disagree
5) All pregnant women should be offered testing for HIV regardless of stated risk behaviors	71	22	4	2
6) HIV antibody testing should be mandatory	27	24	29	15
7) An HIV-infected woman should be encouraged to terminate her pregnancy	3	16	53	21

	Yes	No
8) You would recommend HIV antibody testing to prenatal or obstetrical patients who have no identifiable risks for HIV infection	54	44
9) Practice has identified HIV-infected women during prenatal care	46	52
10) Have prescribed AZT for a pregnant patient	25	72
11) Have heard about a study that showed that AZT can affect transmission of HIV to the infant of an infected mother	90	8

* Percentages do not always total 100 because of missing data

recommended testing women they considered to be at risk for HIV infection, 54% would test pregnant women who had no identifiable risk factors.

HIV counseling and testing practices of the respondents did not vary significantly according to their gender, race/ethnicity, number of years in practice, or geographic location of the practice. However, as Table 3 shows (next page), provider responses did vary according to the type of practice (public health clinic, tertiary care center, or private office/clinic/HMO) and according to the type of patients commonly served (privately insured vs self-pay, uninsured, or publicly insured patients). Practice setting was highly related to the types of patients served; 100% of public health practitioners and 84% of tertiary care practitioners stated that most of the women they served were self-pay, uninsured, or publicly insured compared to 30% of the private office/clinic/HMO practitioners.

Most (90%) of the survey respondents knew of the experimentally demonstrated benefits of prenatal treatment with ZDV. Many providers had experience caring for one or more HIV-infected pregnant women, and 236 of 511 (46%) said that their practice had identified at least one HIV-infected woman during prenatal care. Of the respondents in these practices, 76% stated that, once identified, HIV-infected women continued to receive prenatal care in their practice; 75% had consulted a tertiary care center, an infectious diseases specialist, a health department, or another health care professional for advice in the care of HIV-infected pregnant women; and 48% had prescribed ZDV for a pregnant patient (60% if the HIV-infected women remained in their practice for prenatal care). Most providers did not believe that HIV-infected women should be encouraged to terminate pregnancy.

Discussion

The overwhelming majority of NC prenatal care providers who responded to this survey said that HIV testing was available within their practices and agreed that *all* pregnant women

Table 3. Percentages of HIV counseling and testing practices of NC prenatal care providers with respect to practice setting and medical insurance status of the majority of women served

	Practice setting				Medical insurance status		
	Public health dept.	Tertiary care ctr.	Priv. office/ clinic/HMO	*p*	Private	Uninsured/ self-pay/public	*p*
1) HIV testing was based on policy to offer testing to all patients:	96	93	77	<0.0001	76	87	0.003
2) You would recommend HIV testing to a prenatal patient with no identifiable risk factors for HIV:	69	62	52	0.025	48	61	0.008
3) 100% of the women you see for prenatal care are offered HIV testing:	82	61	68	0.033	67	67	0.972
4) Agreed or strongly agreed that all pregnant women should be offered testing for HIV regardless of stated risk behaviors:	98	97	94	0.220	90	98	0.001

should be offered testing for HIV. Nevertheless, our survey suggests that (at least in 1995) some NC prenatal care providers offered HIV counseling and testing based on an assessment of the woman's risk of HIV exposure rather than a policy of testing all pregnant women. A 1995 study of primary care providers in California[7] found similar results: few providers supported policies that limited HIV testing only to women at risk, but in practice providers were more likely to encourage women with risk factors to be tested.

Because some providers reported that they did not uniformly offer HIV counseling and testing to pregnant women it is possible that, as of 1995, some HIV-infected pregnant women went undetected in North Carolina. Previous studies have documented that risk-based HIV counseling and testing identifies fewer HIV-infected women than does routine testing of all pregnant women.[8,9] A North Carolina study suggested that the mothers of up to 18% of HIV-exposed newborns in 1994 were not tested for HIV.[3] A risk-based approach to HIV counseling and testing during pregnancy itself runs the risk that HIV infection will go unrecognized.

Our survey found that counseling and testing beliefs, policies and practices were related to the method of payment for care and to the type of prenatal care site. Those who provided care to patients who did not have private insurance were more likely to believe that all women should be tested for HIV regardless of stated risk behavior. Compared to those who provided care for patients with private insurance, those who cared for public, self-pay, or uninsured patients were more likely to work in practices which had policies to offer HIV testing to all patients, and were more likely to recommend HIV testing to prenatal patients with no identifiable risk factors for HIV infection. Our data suggest that women receiving prenatal care in private offices are less likely to be tested for HIV during pregnancy than women receiving care in public health departments.

North Carolina providers were knowledgeable about the health benefits of ZDV for HIV-infected pregnant women. A large number of respondents had identified HIV-infected women during pregnancy and had prescribed ZDV for pregnant patients. These providers made good use of consultative services for care of HIV-infected pregnant women.

Since our study was conducted, North Carolina law has been amended. Now providers are required to counsel all pregnant women about HIV and to offer voluntary HIV testing. An ongoing multisite study sponsored by the Centers for Disease Control will assess HIV counseling and testing rates among cohorts of pregnant and parturient women in central NC.[10] Another, planned study will survey a sample of NC prenatal care providers regarding their HIV counseling and testing practices. These studies will measure the effects of the recent changes in NC law. We can only hope that they will find a significant increase in the frequency of testing pregnant women and ultimately further reducing perinatal transmission of HIV in NC. ❑

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A Program to Control Breast and Cervical Cancer in North Carolina

Eugene J. Lengerich, VMD, MS, Elizabeth A. Conlisk, PhD,
Etta Pisano, MD, Lorna Harris, PhD, and Joseph Holliday, MD, MPH

Regular screening of women for breast and cervical cancer, coupled with timely and appropriate follow-up of positive or suspicious screens, could save the lives of approximately 570 women in North Carolina each year. Despite this, screening is underused here, especially by low-income women. This provided the stimulus to develop the North Carolina Breast and Cervical Cancer Control Program (BCCCP). We describe here the epidemiology of breast and cervical cancer in North Carolina and report on the statewide effort to lower breast and cervical cancer deaths, especially among low-income women.

We used data from three surveillance systems to assess screening for, incidence of, and mortality from breast and cervical cancer in North Carolina. The NC Behavioral Risk Factor Surveillance System, an annual telephone survey of adults in more than 3000 households, allowed us to estimate rates of screening for breast and cervical cancer from 1990-1995. The NC Central Cancer Registry provided data on the incidence of breast and cervical cancer from 1990-1993. Finally, the NC Vital Statistics System provided data on mortality from breast and cervical cancer from 1980-1995. Both mortality and incidence data were age-adjusted by the direct method to the 1970 US population.

Epidemiology

Breast cancer. Breast cancer is now the second most commonly diagnosed cancer and the second leading cause of cancer deaths in North Carolina women (lung cancer took over first place in 1990). During 1997, an estimated 5200 new cases of breast cancer were diagnosed and 1250 North Carolina women died of breast cancer.[1] From 1990-1993, the incidence of breast cancer increased slightly among nonwhite women (Table 1, next page), but this may be due to increased screening. From the mid-1980s to the early 1990s, mortality from breast cancer remained relatively steady (Table 2, next page), but recently the mortality of white women has decreased and that of nonwhites, increased. The incidence of breast cancer is about 20% lower in nonwhite than in white North Carolina women, but the mortality rate is about 20% higher. The disparity in mortality reflects two facts: nonwhite women are less likely to be diagnosed at early, more curable stages; they have lower survival rates at any given stage at diagnosis.[2,3]

Early detection is essential to decreasing the mortality from breast cancer because we have no way of preventing it. Age is the strongest risk factor for breast cancer; 78% of cases occur in women over age 50.[4] Randomized trials show that regular mammography and breast examinations by a trained clinician can reduce breast cancer mortality in women older than 50 by 30%.[5] This means that the lives of approximately 420 North Carolina women could be saved per year.

Because some studies do not show a significant decrease in mortality from screening women aged 40-49, there are no consensus recommendations for this age group. However, in 1995, only 67% of women age 50 and older, for whom there are clear guidelines, reported a mammogram in the past two years (Table 3, next page). Fortunately, rates of mammography use have been increasing in recent years, especially among blacks (Table 4, next page). By 1995, black women reported being screened at approximately the same rate as white women. Still, women who are older, poorer, live in a rural county, have less education, and have no health insurance are less likely to be screened.[6]

Cervical cancer. Although mortality from cervical cancer has

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declined since the Pap smear was widely introduced in the 1940s, cervical cancer continues to be a serious problem in North Carolina. In 1997 alone, we expected 460 new cases of and 150 deaths from invasive cervical cancer in North Carolina,[1] despite the fact that nearly all these deaths are preventable.[7] Nonwhite women bear a disproportionate share of this burden because they have an incidence approximately twice that of white women (Table 1). Cervical cancer mortality of nonwhites and whites has declined during the past 15 years, but continues to be about three times higher for nonwhites than whites (Table 2). As a result of the lag time during which mild cervical dysplasia progresses to invasive cervical cancer, the incidence and mortality from cervical cancer increase dramatically with age—women over 50 have three times the incidence and six times the mortality rate of younger women.

Some 80%-90% of women with cervical cancer are infected with human papilloma virus, which is considered to be the major cause of cervical cancer. However, until infection from this virus can be prevented or eradicated, the best defense against invasive cervical cancer is early detection by Pap smear and subsequent treatment. In recent years, rates of Pap screening in NC have been generally high, but they vary by age (Table 5, next page). Rates decline just at the ages where the risk of cervical cancer incidence and mortality increase. More than 91% of women aged 18-49 report having a Pap smear within the past three years compared to 83% of women 50-64 years, and 69% of women 65 or older. Black women are just as likely as white women to report having had a Pap smear within the past three years. Pap screening rates decline with educational level and household income, but have remained steady in recent years.[6]

Table 1. Incidence* of breast and cervical cancer, by race, NC, 1990-1993

		BREAST CANCER			CERVICAL CANCER	
Year	**White**	**Nonwhite**	**TOTAL**	**White**	**Nonwhite**	**TOTAL**
90	109	84	104	9	15	10
91	113	90	109	8	13	9
92	113	92	109	8	17	10
93	112	94	109	8	14	9

* Rates per 100,000 female pop.; age-adjusted by the direct method to the 1970 US population distribution
Source: State Center for Health Statistics, NC Dept. of Health and Human Services

Table 2. Mortality* from breast and cervical cancer, by race, NC, 1981-1993

		BREAST CANCER			CERVICAL CANCER	
Year	**White**	**Nonwhite**	**TOTAL**	**White**	**Nonwhite**	**TOTAL**
81	23	24	23	3	11	5
83	24	27	24	3	9	4
85	26	30	27	3	9	4
87	26	31	27	3	8	4
89	26	30	26	2	8	3
91	25	30	26	2	7	3
93	24	31	25	2	6	3

* Three-year moving average of annual rates (per 100,000 female pop.); age-adjusted by the direct method to the 1970 US population distribution
Source: State Center for Health Statistics, NC Dept. of Health and Human Services

Table 3. Percentage of women age 50 or older who have had a mammogram within the past two years, NC, 1995

Age	Non-Hispanic white	Non-Hispanic black	Total
50-59	71%	80%	73%
60-69	69%	62%	68%
70+	61%	54%	60%
All ages	67%	66%	67%

Source: Behavioral Risk Factor Surveillance System, NC Dept. of Health and Human Services

Table 4. Percentage of women at least 50 years of age who had a mammogram in the past two years, by race, NC, 1990-1995

Year	Non-Hispanic white	Non-Hispanic black	TOTAL
90	61	51	59
91	64	57	62
92	63	55	62
93	67	63	66
94	70	58	68
95	67	66	67

Source: Behavioral Risk Factor Surveillance System, Division of Community Health, NC Dept. of Health and Human Services

Table 5. Percentage of adult women with a uterus who have had a Pap smear within the past three years, NC, 1995

Age	Non-Hispanic white	Non-Hispanic black	Total
18-24	89%	100%	92%
25-34	94%	92%	93%
35-49	89%	89%	88%
50-64	85%	79%	83%
65+	71%	62%	69%
All ages	85%	88%	87%

Source: Behavioral Risk Factor Surveillance System, NC Dept. of Health and Human Services

National Public Health Efforts

Congress passed the Breast and Cervical Cancer Mortality Prevention Act in 1990.[8] This legislation established a nationwide, comprehensive program to increase breast and cervical cancer screening services for medically underserved women. This act provided state health agencies with the opportunity to build a public health infrastructure for cancer control at the state and community levels. In summer 1991, $30 million was disbursed to states to establish early detection programs. The National Breast and Cervical Cancer Early Detection Program has since become a nationwide effort with a budget of more than $140 million. Fifty states and territories and 13 Native American tribes have support for comprehensive screening programs.

North Carolina Breast and Cervical Cancer Control Program. North Carolina was one of the first 12 states to receive federal funding for the BCCCP. The program is administered by the NC Division of Community Health and, since January 1995, has a presence in all 100 counties. The primary goals of BCCCP are to promote breast and cervical screening of low-income NC women; to provide funds for screening of eligible patients; to assure timely and appropriate follow-up; to train health professionals; and to assure high-quality facilities.

BCCCP contracts with local health departments, community health centers, and the Cherokee Health Delivery System to recruit and screen medically underserved women. Funds for diagnostic and follow-up care and treatment of women with abnormal screening results are often provided by the NC Cancer Control Program. In addition to providing initial screenings, local programs have matured to the point that they are emphasizing rescreening of women. To encourage the full and effective use of funds, BCCCP uses a performance-based scoring system that encourages local agencies to meet or exceed goals. The scoring system is based on:

- The percentage of the target number of women actually screened;
- The number of screened women age 50 or older;
- The percentage of women receiving both breast and cervical cancer screening;
- The percentage of annual funds expended.

Coalition

Because coordinated efforts can improve both access to and quality of breast and cervical screening services for North Carolina women, BCCCP joined with the NC Division of the American Cancer Society and NC Equity to form the NC Comprehensive Breast and Cervical Cancer Control Coalition. The Coalition's mission is to reduce mortality and morbidity from breast and cervical cancer by making practical and proven strategies available to local communities. The Coalition consists of 70 different organizations organized into four work groups: public education, public policy, professional education, and surveillance/evaluation. Coalition activities include:

- Develop and distribute approximately 11,000 copies of two handbooks: *Breast Cancer in North Carolina* and *Cervical Cancer in North Carolina.*
- Develop clinical guidelines (*Breast Health: A Guide for Health Departments* and *Pap Smear Screening: A Guide for Health Departments*) and distribute to local health departments and primary care providers.
- Regularly publish and distribute *Focus on Women*, a newsletter that facilitates communication between BCCCP, the Coalition, and service providers.
- Develop, test, and disseminate, in collaboration with the Cancer Information Center at Duke University, public education materials such as pamphlets, posters, a patient wallet card, and incentive items such as jar grippers, church fans, potholders, and magnifying glasses.
- Advocate policies to increase access to and availability of screening services for all North Carolina women.
- Work with businesses to increase worksite screenings.
- Sponsor conferences, including a video conference, "Building Partnerships for Breast Health Outreach."

The coalition has assumed responsibility for the breast and cervical cancer screening activities identified in the NC Cancer Control Plan 1996-2001.[9]

Screening

From the beginning, the number of women screened each year has exceeded BCCCP's goals—and discovered 244 cases of breast cancer and 16 cases of cervical cancer. From July 1, 1995 through June 30, 1996, more than 19,750 women were screened, exceeding the state goal of 14,660 by 35%. In 1996, 77 of 100 counties met or exceeded their target caseloads for the year, some by as much as 400%. Two-thirds of women screened and 70% of those receiving initial mammograms were for women age 50 or older. Forty-two percent of the women screened were minorities, even though minorities represent only 33% of women who meet BCCCP eligibility requirements.

Public Education

Extensive local and state outreach efforts are the key to recruiting older, lower-income women for screening services. BCCCP has encouraged and trained local staff and community members to use lay health advisors and outreach workers, and to create local coalitions with churches and other community organizations. Sixty counties have received training and funds to increase outreach efforts to women, particularly those who have been hard to reach. Counties are encouraged to target efforts to particular populations. For example, Robeson County has made extensive use of the Circle of Life program developed by the American Cancer Society with Native Americans.

North Carolina-specific promotional and educational materials, public service announcements, and other media material have been developed and distributed. Prior to Mother's Day in 1994 and 1995, all Medicaid recipients received mailings detailing BCCCP services; food stamp recipients received similar flyers. The Pink Ribbon Campaign, a statewide public awareness campaign, targeted beauty shops, churches, and other community facilities and organizations. In 1996, the North Carolina News Network, which is used by more than 70 local radio stations, ran public service announcements twice a day for four weeks. Assisted by BCCCP, the National Educators Association conducted two pilot projects in North Carolina for a national program to encourage and train school nurses to help school employees do breast self-exams. In April 1994, the toll-free phone number (1-800-4CANCER) of the Cancer Information Service at Duke was linked to BCCCP's information and referral network.

"Through 18 courses on mammography quality control, more than 500 radiologic technologists and radiologists have received training on positioning, clinical and phantom image quality evaluation, processor quality control, and data collection."

Professional Education & Quality Assurance

BCCCP has worked closely with UNC-Chapel Hill and the NC Division of Radiation Protection to provide professional education and quality assurance for mammography. First, these organizations trained staff and improved procedures at 31 mammography centers which were then designated as regional models and resource sites. Technologists from other sites who have difficulty with quality control or breast positioning are referred for practical training at one of the quality centers.

Secondly, these organizations provide quality control educational programs for radiologic technologists who perform mammograms and radiologists who interpret them. Through 18 courses on mammography quality control, more than 500 radiologic technologists and radiologists have received training on positioning, clinical and phantom image quality evaluation, processor quality control, and data collection.

Thirdly, 39 on-site educational interventions have been provided to mammographic facilities at risk for closure by the Food and Drug Administration for noncompliance with 1992 federal Mammography Quality Standards Act regulations. The interventions increase the ability of radiologic technologists to troubleshoot and correct problems with image quality.

To provide mammography services where needed most, the first facilities to receive assistance were those in medically underserved areas. Thirty-six of the first 37 facilities have completed the entire process; 31 improved image quality and are currently in good standing, one had no change in image quality, and four sites voluntarily closed because they could not commit to keeping the facility open and performing at standard.

Finally, a breast screening fellowship was developed. It includes self-study modules and supervised rotations at a mammography facility, a breast surgery facility, an oncology clinic, and a radiation oncology facility. Observation and case study are important components of the fellowship.

To assure high-quality cervical screening and care in areas with a limited number of physicians, BCCCP has developed and provided standardized training in colposcopy to 17 mid-level practitioners. BCCCP and Area Health Education Centers have provided training, including a six-month clinical preceptorship, in adult physical assessment to more than 325 public health nurses and mid-level practitioners. This program qualifies them to perform examinations and bill for their services through Medicaid. BCCCP also funded the training of public health cytotechnologists at the NC Public Health Laboratory, which reads 58% of BCCCP Pap smears.

In 1993, BCCCP contracted with Duke to survey the knowledge, attitudes, and beliefs on cancer prevention of public health nurses.[10] The 1470 nurses who returned the survey (78% response rate) had good knowledge of screening guidelines. Eighty percent recommended mammograms for women over age 50. The vast majority (98%) of nurses recognized that a positive family history was a risk factor for breast cancer and 96% knew that having had a sexually transmitted disease was a risk factor for cervical cancer. However, less than half recognized increased age as a risk factor for either breast or cervical cancer. The only significant predictor of knowledge about risk factors was recent participation in a cancer education course, such as those sponsored by BCCCP.

Evaluation and Surveillance

BCCCP contractors use the adult health component of the state's Health Services Management System, an on-line data collection system, to describe patients, services, and outcomes for each patient encounter. This allows BCCCP to provide local programs with monthly summaries of county performance, pending and duplicate records, women eligible for rescreening, and identified cancer cases.

A conditional data matching program linking 1993-1995 BCCCP patient files with 1993-1995 cancer registry incidence data allows us to verify cancer diagnoses and assure data quality, identify interval cancers, and evaluate performance of breast cancer services provided by the 100 mammographic facilities serving BCCCP. Preliminary results show that screening mammograms were abnormal in 80% of women diagnosed with cancer within one year of the mammogram (that is, sensitivity was 80%) and that 14% of women who had an abnormal screening mammogram are diagnosed with cancer within one year (the positive predictive value was 14%).

Conclusions

Despite an increase in mammographic screening, breast cancer mortality has not decreased in North Carolina. Minority women have a lower incidence of, but disproportionately higher rates of death from breast cancer. The difference in mortality rates between ethnic groups has not decreased during recent years.

The incidence of cervical cancer has not changed dramatically in recent years, but mortality from cervical cancer has decreased. Incidence and mortality among nonwhites continues to be greater than among whites, but the disparity in mortality has decreased recently. The rate of Pap smear screening has not changed substantially; it continues to be low for older women, the group at highest risk of cervical cancer.

> "At both state and local levels, the Breast and Cervical Cancer Control Program responds to public health needs by working with health care providers to increase public awareness of the value of timely screening and the availability of high-quality care in North Carolina."

Physicians and other health care providers play an important and essential role in breast and cervical screening and in the follow-up care of screened patients. At both state and local levels, BCCCP responds to public health needs[11] by working with health care providers to increase public awareness of the value of timely screening and the availability of high-quality care in North Carolina. Together, BCCCP and its partners can increase the rate of screening and reduce the rate of death from breast and cervical cancer in North Carolina.

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Response to a High Infant Mortality Rate
The Guilford County Adopt-A-Mom Program

Harold D. Gabel, MD, MPH, and Judith M. Penny, PhD

In 1988, North Carolina had the highest infant mortality rate in the country. This fact woke up agencies and individuals throughout the state. Something had to be done to improve infant mortality. In 1988, Guilford County's infant mortality rate of 10.6 (per 1000 live births) ranked it 50th of the 100 counties in North Carolina, and 56 babies in Guilford County died before their first birthday.

In response to this appalling situation, Guilford County, under the leadership of the County Department of Public Health, formed a Coalition on Infant Mortality made up of doctors, nurses, hospital administrators, business and church leaders, citizens, and pregnant women. The Coalition determined that low birth weight was the single greatest contributor to infant mortality and that inadequate prenatal care was the single greatest contributor to low birth weight. Pregnant women with no prenatal care were three times more likely to deliver low birth weight babies than those with adequate prenatal care.

In 1988, The Guilford County Health Department provided prenatal care for Medicaid-eligible women and for those living below 100% of the poverty level, but staffing and space limitations prevented extending the program to other uninsured women. Care was also available through private obstetricians who accepted Medicaid-eligible patients, but this left unserved a group which was not Medicaid-eligible and did not have sufficient resources to pay for obstetrical care.

A Response to the Problem

In 1991, the Coalition on Infant Mortality instituted the Adopt-A-Mom program to provide early and continuous prenatal care to pregnant women in Guilford County who could not afford or obtain care elsewhere. The Adopt-A-Mom Program, using funds solicited from foundations, groups, and individuals, paid private obstetricians $400 to provide prenatal care to eligible women. The program continues today, employing a coordinator and two outreach workers who educate the community about the benefits of prenatal care. They identify pregnant women in need, arrange care for them, and follow up on missed appointments (if necessary). An optional mentoring program uses community volunteers to provide enrolled women with support and assistance; 41% of the patients have chosen to participate in the mentoring program.

Greensboro and High Point are the two main cities in Guilford County. In Greensboro, deliveries are attended by doctors from the obstetrical teaching service, or the physician-on-call, at Women's Hospital of Greensboro. In High Point, deliveries are attended by the obstetrician who provides prenatal care to the patient. All participating physicians may refer high-risk patients to the High Risk Clinic at Women's Hospital in Greensboro.

Each pregnant patient must pay for the costs of delivery and other expenses incurred outside the physician offices. Amniocentesis, if needed, is available at no charge through the Wake Forest University School of Medicine in Winston-Salem. The program coordinator often helps patients arrange to pay delivery costs, but by the time of delivery, many women in the Adopt-A-Mom Program are eligible for Medicaid, which covers all costs associated with delivery and hospital stay.

The Adopt-A-Mom Program is monitored and evaluated by the Division of Family Planning/Maternity of the Guilford County Department of Public Health. To date, the Program has served 470 women in Guilford County and has involved 10 ob/gyn practices (seven in Greensboro and three in High Point).

Of the first 163 women to complete the program, the average age was 25 (range: 14-39); 14% were adolescents, 60% were in their 20s and 27% in their 30s. Most of the women in the program were married (60%), a few were separated or divorced (2%), and the rest were single (38%). Racial/ethnic backgrounds varied; the largest group was Hispanic (47%), followed by white (20%), black (18%), Asian (9%), and Middle Eastern (6%). For 55% of women this was their first pregnancy; 45% had one to six previous children.

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About equal numbers of women entered prenatal care during the first (41%) and second (43%) trimester; 16% entered during the third trimester. Women who completed their pregnancy made an average of 11 (range: 2-19) prenatal visits. A remarkable 93% of these women missed no more than one appointment, and 78% did not miss even one.

Results of the Program

Most of the women who completed the program experienced no complications, but 13% of the women experienced pregnancy-induced hypertension, gestational diabetes, twin births, premature rupture of membranes, HELLP (hemolysis, elevated liver enzymes, and low platelet) syndrome, group B strep infection, polyhydramnios, eclampsia, or preterm labor. The number of Guilford County deliveries by women who received no prenatal care decreased from 125 in 1991 to 63 in 1996.

The 163 women who have completed the program delivered 72 girls and 93 boys, including two sets of twins. Birth weights averaged 3310 grams (range: 1559-4805 grams [3.4-10.6 pounds]). Only 10 (6%) of the babies weighed less than 2500 grams (5.5 pounds), and three of these were twins.

Most (83%) of the babies were born by vaginal delivery; 17% were born by C-section. Most deliveries (77%) were uncomplicated, but there were some complications: prolapsed cord, maternal fever, fetal distress, failure to progress in labor, cephalopelvic disproportion, shoulder or other breech presentation, arrested descent in labor, and nuchal cord. There were no infant deaths.

Ten infants who experienced problems (prematurity, sepsis, respiratory distress, meconium aspiration, or blood-type incompatibility) were sent to the Neonatal Intensive Care Unit. None died. One infant was postmature (born at 43 weeks). One child was born with a genetic abnormality of finger and toe development.

> "The Adopt-A-Mom Program cannot by itself eliminate infant mortality in Guilford County, but it can and does provide a community-generated option for pregnant women who need care."

What Lies Ahead?

The Adopt-A-Mom Program cannot by itself eliminate infant mortality in Guilford County, but it can and does provide a community-generated option for pregnant women who need care. About 85% of pregnant women who come to the Guilford County Department of Social Services are eligible for pregnancy and delivery care through Medicaid. Nevertheless, there is a large group of women who cannot afford pregnancy care because they or their husbands work but have no maternity insurance, or because their salary is too low to allow out of pocket payment. The Adopt-A-Mom program allows these "gray area" women and others who "fall through the cracks" to obtain care and avoid the adverse pregnancy outcomes that can result from inadequate prenatal care. Of course, the community ultimately bears the consequences of deficient prenatal care when it must pay for the resulting pregnancy complications or intensive neonatal care.

Financial contributions by local individuals, churches, businesses and service organizations, and the efforts of practicing obstetricians have sustained the program at little or no cost to governmental agencies. During the course of its existence, more than $155,000 has been contributed to the Adopt-A-Mom program and has been used exclusively to offset the costs of prenatal care. The extremely low rate of missed prenatal visits indicates an appreciation and acceptance of the program by the women who need and use it. In an ideal world, accessible, affordable, high-quality prenatal care would be available to everyone in need. Until such a time, Guilford County is fortunate to have the Adopt-A-Mom program. ❑

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Isolated Extremity Soft Tissue Injury

An Occupational Hazard in Rural Eastern North Carolina

John L. Scheitler, MD, William A. Wooden, MD, Jeanette M. Dolezal, PhD,
Bonnie Long-Snyder, RN, and Paul R. G. Cunningham, MD, FACS

Severe soft tissue injury of the extremities is common in rural settings.[1-3] These injuries result from motor vehicle and machinery accidents, lacerations, and gunshot wounds. Few published reports offer a broad survey of such injuries, and particularly lacking is any longitudinal view of the economic burden of treatment, rehabilitation, and recovery. Although extremity injuries are not likely to threaten life, they clearly have the potential to cause disability.

For this study, we categorized patients who suffered major soft tissue injuries of the extremities and were treated at the University Medical Center of Eastern Carolina-Pitt County (UMCEC-PC), a rural, level one trauma center. Our review demonstrates the magnitude of such injuries in eastern NC.

Methods

Through retrospective review of the computerized trauma registry at UMCEC-PC, we identified 202 patients (1.8% of 11,155 patients) admitted between October 1987, and December 1994, with isolated soft tissue injuries to the extremities. We excluded patients with multisystem trauma involving cranial, thoracic, abdominal, or pelvic injuries. The mechanisms of injury were determined by case review, and the detailed numerical codes used to document these mechanisms were identified from the trauma registry.

Patients were classified according to mechanism of injury, race, gender, age, mode of transportation to UMCEC-PC, length of stay, method of payment, discharge destination, and injury severity score (ISS). The ISS is a numerical description of the overall severity of an injury. It is the sum of the squares of the highest abbreviated injury scale (AIS) code for each of the three most severely injured ISS body regions. The AIS is a consensus-derived, anatomically based system that classifies individual injuries by body region on a 6-point ordinal severity scale ranging from AIS 1 (minor) to AIS 6 (currently untreatable). The resulting ISS allows comparison of injury severity among individuals.[4] For isolated extremity trauma, an ISS of 1 represents the least severe of injuries and 25, the most severe.

We calculated descriptive statistics including means and standard deviations. We used independent t-tests to compare means for ISS, patient age, length of hospitalization, and total hospital charges for helicopter-transported patients compared to those transported by other means. We used a Fisher's exact test to compare the numbers of patients transported by helicopter who were discharged to home or other location compared to patients transported by other means.

Results

Table 1, next page, gives sociodemographic information about the study population, transportation mode from site of injury, destination after hospital treatment (this was not recorded for 13 patients), and payment method. The racial and gender distribution of injuries largely reflects the distribution of workers employed in the region. Table 2 shows the distribution of patients according to mechanism of injury. As can be seen, the vast majority of injuries were caused by machines used in the workplace. Table 3 gives the mean ISS, patient age in years, length of hospitalization in days, and charges at discharge.

We compared characteristics of patients transported to UMCEC-PC by helicopter to those of patients transported by other means (Table 4). Not shown in the table, 18/29 or 62% of patients transported by helicopter were discharged home compared to 166/173 or 96% of patients transported by other means. Not surprisingly, these percentages differ significantly from one another ($p<0.001$ by two-tailed Fisher's exact test).

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Table 1. Characteristics of 202 injured patients

	Number of patients
Race	
White	101 (50%)
Black	81 (40%)
Other	20 (10%)
Gender	
Male	182 (90%)
Female	20 (10%)
Transportation from site of Injury	
Ambulance	109 (54%)
Private car	59 (29%)
Helicopter	29 (14%)
Police	1 (1%)
Unknown	4 (2%)
Destination after hospital treatment	
Home	176 (86%)
Unknown	12 (5%)
Rehabilitation center	5 (2%)
Nursing home	3 (2%)
Death	3 (2%)
Hospital transfer	2 (2%)
Prison	1 (1%)
Payment method	
Worker's compensation	114 (56%)
Self pay	35 (17%)
Commercial	17 (8%)
Blue Cross/Blue Shield	17 (8%)
Medicare	10 (5%)
Medicaid	5 (3%)
Champus	2 (1%)
HMO	1 (1%)
Unknown	1 (1%)

Table 2. Distribution of patients by mechanism of injury

Type of injury	Number of patients
Accident by machinery	191 (95%)
Agricultural	82
Miscellaneous	42
Lifting machinery	21
Unspecified	15
Woodworking	14
Metalworking	8
Earthmoving machinery	7
Caught in or in-between objects	2
Motor vehicle collision	7 (3%)
Lacerations	3 (1%)
Gunshot wounds	1 (1%)
Total	202 (100%)

Table 3. Descriptive statistics for 202 injured patients

Variable	Mean	±SD
Age (years)	37	±16.6
Length of hospital stay (days)	9	±10.8
Hospital charges	$11,322	±3765
Injury severity score (ISS)	7	±2.4

Table 4. Characteristics of patients transported by helicopter compared to patients transported by other means

	Helicopter	Other	p*
Total number of patients	29	173	
Injury severity score (ISS)	11	6	0.001
Age	32	38	0.083
Hospital days	20	7	0.001
Hospital charges	$29,099	$7,963	0.001

*significance of difference by t-test

Discussion

Agricultural injuries are a major source of death and disability in our nation. Eastern North Carolina is a predominantly agricultural region. Our study emphasizes that agricultural machinery is a major cause of soft tissue injuries of the extremities in this rural area; an overwhelming preponderance (95%) of injuries involved machinery (Table 1). Other similar studies have found agricultural machines, especially tractors, to be a significant cause of injuries and death.[5] More than 50% of tractor injuries are to the extremities.[6] Analysis of how these trauma patients are handled in the emergency department may reveal ways to lessen the mean hospital stay from nine days, and emphasis on prevention may help decrease the incidence of these injuries.

Motor vehicle accidents were a minor cause of injury in our study, possibly because we excluded multisystem trauma. However, other studies have shown that motor vehicle accidents can cause isolated extremity injuries.[7] Nationwide, upper and lower extremity injuries resulting from motor vehicle accidents have an annual medical cost of $1.76 billion.[8]

We found worker's compensation to be an important source of reimbursement for medical care of this sort of injury (Table 2). The fiscal impact of these injuries is shown by the fact that for a mean ISS of 7, the mean hospital charge per patient was more than $11,000 (Table 3). The aggregate hospital charges for the 202 patients amounted to well over $2 million (exclusive of lost income), documenting the tremendous drain such injuries place on the scarce resources of eastern North Carolina, a region in which 17% of the population lives in poverty.[9]

Patients transported by helicopter were more severely injured as shown by a significantly higher ISS (Table 4). Helicopter-transported patients had significantly longer hospital stays and higher charges; they needed more time for recuperation, and were significantly less likely to be discharged home than patients transported by other means. No doubt helicopter transport maintains a high standard of care, but at the expense of resources. Adherence to the principle of trauma's "golden hour" may well be the reason that 62% (18/29) of helicopter-transported patients could be discharged home rather than to a rehabilitation facility or some other destination, but this is still much lower than the 96% (166/173) of those not transported by helicopter who were discharged home.

Our study indicates that most patients with extremity injuries admitted to the Trauma Center were injured in a job-related incident. Few (2%) died, so the primary issue relates to the disability that extremity injuries can cause. Given the rural region served by UMCEC-PC and the severity of these soft tissue injuries, we need to find ways to minimize and better treat these wounds.[10] Improved care means prevention, increased community awareness, continued adherence to advanced trauma life support principles[11] for salvaging soft tissue injuries, and better ways to transport patients from the injury site to the hospital. Education to optimize emergency management at outlying community hospitals also remains important. The era of managed health care demands that we provide quality care while minimizing expenditures. ❑

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OCCUPATIONAL HEALTH

Emergency Events Involving Hazardous Substances in North Carolina, 1993-1994

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The Agency for Toxic Substances and Disease Registry (ATSDR) established a state-based Hazardous Substances Emergency Events Surveillance (HSEES) system to assess the public health impact of hazardous substance releases and threatened releases in 1990.[1] North Carolina is one of 14 states currently maintaining a HSEES system. We describe here the characteristics and public health consequences of hazardous substance emergency events reported to the North Carolina HSEES system over a two-year period.

Methods

Hazardous substance emergency events are reported to the HSEES from three sources: (1) the Division of Emergency Management, located in the Department of Crime Control and Public Safety, (2) the Division of Water Quality, located in the North Carolina Department of Environment, Health and Natural Resources, and (3) the National Response Center, US Coast

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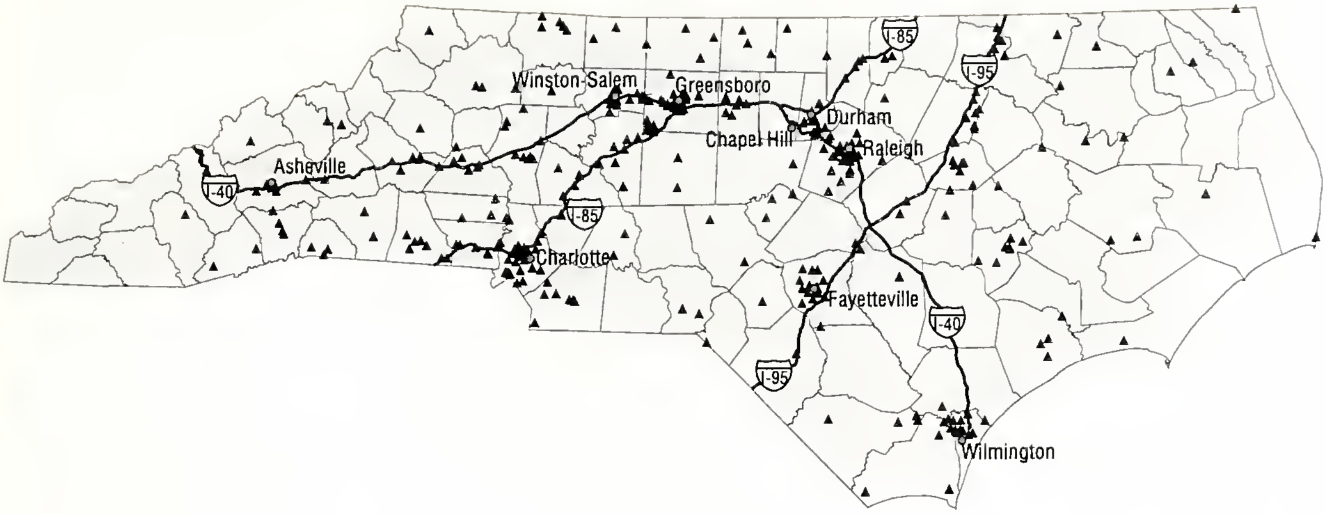

Fig 1: Reported hazardous substance release locations, North Carolina, 1993-1994. Each point may represent one or more event sites. Source: NC Department of Health, Environment and Natural Resources, State Center for Health Statistics.

Guard. The HSEES public health epidemiologist conducts telephone interviews with local emergency management coordinators, firefighters, hazardous materials (HAZMAT) team responders, and environmental affairs representatives of private industries. A standardized form designed by ATSDR is used to collect data regarding characteristics of the event, chemicals released, affected persons, injuries, and evacuations.

A hazardous substance emergency event is entered into the HSEES system if it meets the following criteria: 1) An uncontrolled or illegal release (or threatened release) of one or more hazardous substances. 2) The substance(s) is any hazardous substance except a petroleum product. 3) Emergency actions are initiated such as control of the release, public health precautions, or evacuations. 4) The hazardous substance(s) released or threatened to be released needs to be removed, cleaned up, or neutralized according to federal, state, or local law.

Results

From January 1, 1993, to December 31, 1994, 507 hazardous substance emergency events met HSEES eligibility criteria. Ninety-five percent of these events (483) involved chemical releases; 5% (24) were threatened releases. Three hundred and seventy-five (74%) occurred at fixed facilities, and 132 (26%) were transportation-related. Nineteen percent of the events (97) occurred in commercial/residential areas followed by industrial/residential areas (68, or 14%). Most (320, or 63%) events were also reported to have taken place within a quarter-mile radius of a residential area.

Figure 1, above, shows the 1993-1994 event locations in North Carolina. Events occurred in 75 of the state's 100 counties. Many of the emergency events occurred on interstate highways or within major population centers.

Table 1. Type and number of injuries for 263 persons injured at hazardous substances emergency events, NC Hazardous Substances Emergency Events Surveillance, 1993-1994

Type of injury	# of injuries	(%)*
Respiratory irritation	178	(36)
Eye irritation	73	(15)
Nausea	71	(14)
Dizziness/CNS symptoms	47	(10)
Headache	39	(8)
Trauma	27	(5)
Chemical burns	19	(4)
Other	14	(3)
Skin irritation	9	(2)
Thermal burns	7	(1)
Vomiting	5	(1)
Heat stress	5	(1)
Total†	494	(100)

* Percentage of all types of sustained injuries

† The total number represents the injuries to the 263 victims; some victims sustained multiple injuries.

Seventy-three percent of the events (362) occurred between 6 a.m. and 6 p.m.; 76 (15%) occurred between 6 p.m. and midnight; and 55 (11%) took place between midnight and 6 a.m. Adverse weather conditions coincided with only 15 (12%) of the transportation-related events and with 38 (11%) that occurred at facilities.

In 95 (19%) events, 263 persons were injured: 168 (64%) were male and 54 (21%) were female; gender was not recorded in 41 cases (15%). Two hundred twenty (84%) were employees, 32 (12%) were members of the public, and 11 (4%) were responders. Table 1, above, indicates that there were 494 injuries reported associated with the events. Respiratory irritation was reported more than any other type of injury and occurred in 178 (68%) of the victims. Some of the victims sustained more than one type of injury. The median number of victims per event was 1 (range, 1-17). Of the 263 victims, 125 (48%) were transported to and treated at a hospital, but not admitted; 74 (29%) were treated on the scene with first-aid; 31 (12%) were transported to the hospital for observation only; 17 (7%) were transported to a hospital and admitted; 8 (3%) were seen by a private physician within 24 hours of the incident; and 3 (1%) of the victims died. The deaths occurred during three separate chemical transportation events. Two of the victims were employees, and one was a member of the public. Trauma was reported as the type of injury for each of the victims; none of the deaths were caused by chemical exposure.

Table 2. Frequency and percentage of chemicals involved and evacuations reported by chemical category in hazardous substances emergency events, NC Hazardous Substances Emergency Events Surveillance, 1993-1994

Chemical category	Frequency	(%)	Evacuations†	(%)
Paints and dyes	92	(16)	2	(2)
Ammonia	86	(15)	14	(16)
Volatile organic compounds	79	(13)	21	(27)
Bases	47	(8)	4	(9)
Other inorganic substances	38	(7)	29	(76)
Pesticides	34	(6)	5	(15)
Chlorine	31	(5)	20	(65)
Acids	25	(4)	19	(76)
Polychlorinated biphenyl	9	(1)	0	(0)
Unclassified	148	(25)	31	(21)
Total	589	(100)		

* Percentage of all involved hazardous substances

† 112 events resulted in (at least 1) evacuation order; some evacuations occurred during events involving more than one type of chemical

Various types and levels of personal protective equipment (PPE) were worn while injuries were sustained. One hundred seventy-three (66%) of the victims were wearing no PPE. Thirty-five (14%) had eye protection; 42 (16%) wore gloves; 20 (8%) wore a hard hat; and 22 (8%) wore steel-toed shoes at the time of injury.

The total number of hazardous substances involved in the 507 events was 589 (Table 2, above). Paints and dyes and ammonia were released or threatened to be released more often than any other major chemical category, with the exception of the unclassified chemical group. Nineteen (76%) of the events involving acids, and 29 (76%) of the events involving other inorganic substances resulted in an evacuation order. Evacuations were also ordered for 20 (65%) of the events involving chlorine.

Twenty-two percent (112) of all events resulted in an evacuation. The duration of evacuations ranged from 1 to 24 hours (median=1 hour), and the number of people evacuated ranged from 2 to 1000 (median=10). Eighty (70%) of the evacuations involved evacuating a building or the affected part of a building; twenty-one (18%) were based on downwind chemical dispersion; and 13 (11%) were based on a circle or radius around the point of release.

Discussion

Most hazardous substance events occur at fixed facilities, and the most commonly associated injuries are respiratory irritation, eye irritation, and nausea. Paints and dyes, ammonia, and volatile organic compounds are involved in these events more than any other type of chemical. Evacuations occurred most frequently in incidents involving acids, chlorine, and other inorganic substances.

A great deal of time and expertise are put into mitigating adverse health effects from chemical emergencies. Hazardous materials emergency responders in public and private agencies have combined efforts to reduce morbidity and mortality associated with hazardous substance emergency events in North Carolina. The findings from the HSEES system may be useful in developing additional strategies for emergency and medical response planning. Other uses of HSEES data may include long-term follow-up of incident outcomes, risk-factor studies, and descriptive studies of unusual events.

One limitation of the surveillance effort is the need to occasionally rely on memory recall to retrieve incident data. Emergency management agencies and private industries have enhanced data collection on hazardous substance events since the inception of the project—allowing for more accurate reporting. Other limitations of the system include the exclusion of petroleum products from surveillance and underreporting due to a data collection system based on passive reporting. ❑

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Shortening Hospitalization After Appendectomy in Children

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Containing the cost of medical care is desirable as long as quality is not compromised. With an overall goal of decreasing costs, and in response to pressures to reduce the length of stay (LOS) in hospital, we have undertaken concerted efforts to decrease the duration of hospitalization after surgery. We tested the effectiveness of our efforts in a common condition that requires operation and hospitalization, appendicitis. We wanted to make sure the economies we achieved did not diminish the quality of care. In particular we wanted to learn what strategies could be safely undertaken in the future to further decrease LOS and in-hospital costs.

Procedures

We retrospectively reviewed the lengths of hospital stay of all children under 18 years of age who underwent appendectomy at the University of North Carolina Children's Hospital for a preoperative diagnosis of appendicitis during the period 1992-1996. We obtained clinical and operative information from patient records, departmental morbidity and mortality reports, and hospital quality assurance records. Cases were analyzed in two groups: Period I (1992-1994) and Period II (1995-1996), chosen to correspond to significant changes in our management of appendicitis during the latter period.

During Period I there were no set criteria for discharge after appendectomy and no pressure to decrease hospital costs by minimizing LOS. Patients were generally discharged once they were afebrile, they had passed stool, and their pain was controlled with oral analgesics. In 1995 our service adopted the protocol that patients undergoing uncomplicated appendectomy would be sent home within 24 hours of admission; those whose appendicitis was complicated by rupture, abscess, or generalized peritonitis would be sent home on intravenous antibiotics when afebrile. At first, patients with complicated appendicitis received antibiotics for a set duration, usually seven days. Then, for selected patients who recovered and became afebrile before completion of the planned course, we began to discontinue parenteral antibiotics, substitute broad-spectrum oral antibiotics, and discharge the patient for home administration of parenteral antibiotics (if the home environment was stable and there were responsible caregivers at home). Discharge was postponed in all cases where the patient's condition or the home environment made home care inappropriate.

Operative and pathology reports were reviewed and each case postoperatively classified as having: normal appendix, uncomplicated appendicitis, perforated appendix, gangrenous appendix, or appendiceal abscess. The pathologist's final report established normality and the absence of acute inflammation. We defined uncomplicated appendicitis as the presence of acute inflammation on microscopic examination without areas of gangrene or perforation. We used either the surgeon's or pathologist's report to determine the presence of gangrene or perforation. A preoperative finding of localized fluid collection on computed tomography or ultrasound examination, or a report of an intraabdominal abscess at operation established the presence of an appendiceal abscess. The technique of appendectomy (usually an open procedure through a Rocky-Davis incision, or a laparoscopic procedure using infraumbilical, suprapubic, and right flank ports) was recorded.

The length of hospital stay was expressed as mean (± standard error of the mean). Data from Periods I and II were compared using unpaired two-tailed t-test; comparisons among multiple groups were made by analysis of variance (ANOVA) with repeated measures. Incidence of complications during the two periods were compared using chi-square tests. P values <0.05 were considered significant.

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Results

Between 1992 and 1996, 97 appendectomies were performed in children aged 1.8-17.5 years. Five records were incomplete, and two (chronic appendicitis; prophylactic appendectomy for fecalith), were inappropriate for study. The remaining 90 records form the basis of this report.

Table 1, below, summarizes the postoperative diagnosis by age group and study period. In 41 cases the diagnosis was uncomplicated appendicitis; in 23, perforation; 11, abscess; and in 8, gangrene. In 7 cases (8% of the total) a normal appendix was found. The percentage of cases in which appendicitis was complicated by either perforation or abscess was highest in the 1-4 year age group (7/12, 58%), but this rate was not significantly higher than that seen in the other three age groups (27/78, 35%).

There were no statistically significant differences in diagnosis by age group between the two time periods, with three exceptions. There was a significant increase in the percentage of appendiceal gangrene from Period I (2%) to Period II (21%; $p<0.05$), attributable to an increase in appendiceal gangrene in the 10-14 year age group (0% to 31%; $p<0.05$). The rate of appendicitis complicated by either perforation or abscess increased from 10% in Period I to 83% in Period II in the 15-19 year age group ($p<0.05$).

The average LOS for all 90 patients was 4.9±0.46 days (mean±sem). There were significant ($p<0.001$) differences in average LOS depending on postoperative diagnosis; 8.7±0.68 days for patients with perforated appendicitis and 12.1±2.50 days for appendicitis complicated by abscess were significantly longer than the 2.1±0.14 days for uncomplicated cases and 2.4±0.37 for gangrenous appendicitis.

Table 2, next page, summarizes the changes in LOS between the two study periods. There were significant decreases in LOS during Period II for uncomplicated appendicitis (average LOS decreased 24%), perforated appendicitis (32% decrease) and appendiceal abscess (51% decrease). Numbers were too small to allow statistical comparison of groups with gangrenous appendix or normal appendix, or to allow comparisons between time periods by diagnosis for individual age groups.

Nearly all patients underwent open appendectomy. Laparoscopic appendectomy was performed in two patients during Period II. Both had a two day LOS; one had an uncomplicated appendectomy; the other, a gangrenous appendix. Both recovered uneventfully, free from postoperative complications.

There were no deaths from appendicitis during either study period. Table 3, next page, summarizes the incidence of wound infections by postoperative diagnosis and study period. There were no differences between time periods in any category. Two children underwent reexploration for early small bowel obstruction (2/90, 2%), both during Period I. During Period I another child developed a pelvic abscess that required drainage at a second operation (1/90, 1%). One child (in Period I) required readmission for early small bowel obstruction (1/90, 1%).

Discussion

The data document our success in decreasing LOS without significantly increasing morbidity. Our strategy decreased LOS for uncomplicated appendicitis by nearly one-quarter, for perforated appendicitis by nearly one-third, and for appendiceal abscess by one-half. These decreases in LOS mean that significant cost savings can be achieved without compromising the quality of medical care as reflected by complication rates. The rates of major surgical complications (wound infections, small bowel obstructions) were unchanged between the two periods.

Table 1. Numbers of appendectomies performed for preoperative diagnosis of appendicitis during 1992-1994 (Period I) and 1995-1996 (Period II).

		All Patients		Age 1-4		Age 5-9		Age 10-14		Age 15-19	
Postoperative diagnosis	Number	Period I	II	Period I	II	Period I	II	Period I	II	Period I	II
Uncomplicated	41	28	13	2	1	5	5	14	6	7	1
Gangrene	8	1	7*	0	1	1	1	0	5*	0	0
Perforation/Abscess	34	22	12	6	1	7	1	8	5	1	5*
Normal	7	6	1	1	0	2	1	1	0	2	0
TOTAL	90	57	33	9	3	15	8	23	16	10	6

* $p<0.05$ compared to Period I by chi-square analysis

Our mean LOS for all patients (4.9 days) compares favorably with figures reported by others. Pearl found that the mean LOS for 1366 patients aged less than 18 years operated on in military hospitals was 4 days.[1] Wen and Naylor reported a mean LOS of 4.6 days for boys and 4.8 days for girls among 5,829 patients aged less that 14 years operated on in Ontario.[2] Using a defined protocol that delayed discharge until the patient was afebrile for 24 hours and the white count and the physical examination were normal, Vane found an average LOS of 5.1 days in 56 patients aged less than 19 years.[3] The LOS in Vane's study ranged from 3-18 days, the minimum (2 days) being longer than our one day hospitalization for uncomplicated cases. Others agree with us that uncomplicated cases can be managed successfully with a one day LOS. McCahill noted that the mean LOS for nonperforated appendicitis in adults fell from 2.4 days in 1991 to 1.4 days in 1994.[4]

Table 2. Mean length of hospital stay (±standard error of the mean) for the preoperative diagnosis of appendicitis by postoperative diagnosis

Postoperative diagnosis	Period I	II	p*
Uncomplicated	2.2±0.17	1.7±0.20	0.03
Gangrene	3.0	3.0±0.33	NS
Perforated	9.3±0.76	6.3±0.62	0.02
Abscess	13.5±2.49	6.6±1.63	0.03
Normal	2.3±0.33	3.0	NS

p* determined by unpiried two-tailed t-test

Table 3. Wound infection rates by postoperative diagnosis

Postoperative diagnosis	Period I	II	All
Uncomplicated	1/28	0/13	1/41
Gangrene	1/1	1/7	2/8
Perforated	3/16	1/7	4/23
Abscess	0/6	0/5	0/11
Normal	0/6	0/1	0/7

The LOS for perforated appendicitis in most reports is 7 days,[2,5] equivalent to our 6.3 days during Period II. With perforation, LOS depends on the duration of intravenous antibiotics, and the removal of drains (if they are placed). Lund described a 10-day regimen for perforated appendicitis with a measured mean LOS of 11.4 days.[5] Azizkhan recommended discharging selected patients with perforated appendicitis on the fifth postoperative day and giving antibiotics at home.[6]

The Milliman and Robertson guidelines call for discharge on the first postoperative day after uncomplicated appendectomy and on the third postoperative day after surgery for ruptured appendix with abscess or generalized peritonitis.[1] The aim of these guidelines is to minimize LOS. The guidelines have been widely circulated and likely will be adopted by the hospital industry as quality of care standards. They provide treatment goals for ideal, complication-free patients.

When in-hospital care is expedited to minimize LOS, many surgical decisions are pushed earlier in the postoperative course than has been traditional. Examples include the initiation and advancement of oral intake after operation and the introduction of oral rather than parenteral analgesics for pain control. Home administration of intravenous antibiotics, or the use of oral antibiotics alone help meet LOS goals in cases complicated by perforation or abscess.

We found the LOS goals for uncomplicated appendectomy easy to achieve, and at present most of our patients require only a single hospital day. The first hospital day is occupied by the operation and the provision of parenteral fluids, medications, and antibiotics. The patient should be ambulatory. On the second day the patient should be without fever, passing flatus, and taking a liquid diet. The intravenous line is discontinued, oral medications prescribed, and the patient discharged. Passage of stool is not a criterion for discharge. The expectation of the physician and nursing team is discharge on the first postoperative day, within 24 hours of admission. Instructions to parents and child are unchanged and directed at home care of the wound, advance to a regular diet, and pain management with oral analgesics.

Achieving the goal of a 3-day hospitalization for a complicated case is more difficult; our shortest stay was four days. The Milliman and Robertson guidelines suppose sufficient recovery to allow discharge by the third postoperative day. Low-grade fever is expected to persist into the second postoperative day, and resolve on the third. Bowel sounds should return on the second postoperative day, and a liquid diet be started thereafter. The home administration of antibiotics is arranged on the first postoperative day, and parents are taught to become proficient by discharge on the third postoperative day. Some patients did follow that course, resolving fever and regaining bowel function 2 or 3 days after operation. Children who were able to drink adequate volumes of liquids without vomiting, were afebrile and appeared healthy enough, were sent home on oral antibiotics before completing a "full 7-day course" of intravenous antibiotics. Of the patients with complicated appendicitis in our series, those staying 4-7 days (Table 2) probably could have been safely discharged on the third day.

Children who are more severely ill often do not resolve fever or regain bowel function within the Milliman and Robertson time frame. They recover more slowly than the previous group, but these patients are probably well enough to be discharged by the seventh or eighth hospital day. We have been reluctant to send these patients home before completing a 7-day course of intravenous antibiotics, but we speculate that by the fourth or fifth day they would be sufficiently stable for discharge if there were sufficient home care to allow the administration of intravenous fluids and antibiotics. Close follow-up with daily telephone calls and home nursing will be required. We suspect that the patients in our series who had LOS of 8-14 days would fall in this category.

There remains a minority who are persistently sick or develop a complication within a week or two of operation. Spiking fever, diffuse abdominal pain, and persistent ileus point to continued, uncontrolled sepsis. Only a handful of patients in our review fell in this category (those hospitalized for more than 14 days). These patients are not candidates for home care.

An aggressive limitation of LOS for complicated appendicitis might lead to rehospitalization for late complications. The moderate approach that we employed reduced the LOS without increasing rehospitalizations. Of course, late small bowel obstruction can occur months or years after recovery. Informed home care providers and parents will help to detect such complications on a timely basis.

Our clinical results such as the rate of finding a normal ("negative") appendix at appendectomy (8%) and rate of perforation (26%) are consistent with those reported by others. In Pearl's series of 1366 patients in military hospitals, the negative appendix rate was 11% in children over 8 years old and 13% in those 8 years and under; the perforation rate, 18% and 33%, respectively.[2] He reported 6 other series where negative appendectomy rates ranged from 5%-12% and the perforation rates, from 19%-52%. Wen and Naylor reported a negative appendectomy rate of 10% for boys and 17% for girls aged 14 years and under.[5] The perforation rate was 24% for boys and 25% for girls.

We noted two significant changes that may reflect delay in obtaining care during Period II: the rate of gangrene increased during in the 10-14 year age group, and the rate of complication by perforation or appendiceal abscess increased in the 15-19 year age group. Appendiceal gangrene did not affect morbidity. LOS was slightly increased, but not significantly, compared to uncomplicated appendicitis (2.4±0.37 vs 2.1±0.14 days). Perforated appendicitis on the other hand was associated with both prolonged LOS and increased wound complications. The reasons for delay in diagnosis are many. Review of the patient records suggests that delays occurred before referral to our institution, a phenomenon noted elsewhere.[7] Uncomplicated cases in the older age groups decreased from Period I to Period II, suggesting that straightforward cases in older children were being treated at community hospitals and not referred to pediatric surgical specialists.

We used laparoscopic techniques in only two patients. McCahill documented that operating room charges for laparoscopy were more than twice those of an open procedure due to prolonged use of operating room, anesthesia, and use of equipment, but there was no demonstrable improvement in outcome measured by number of complications or LOS.[8] A recent randomized trial in adult men found that laparoscopic appendectomy required significantly longer anesthesia and operating time, without a significant difference in postoperative pain, recovery of bowel function, or LOS (4.9 vs 5.3 days for open appendectomy).[9] We could not address the question of whether open or laparoscopic appendectomy produced shorter LOS. However, with LOS approaching one day after open procedures, it is unlikely that a laparoscopic approach will shorten this any further. Since operating room costs are higher for laparoscopic than open appendectomy,[5] it is unlikely that there will be a cost advantage in favor of laparoscopy.

Conclusion

Our experience with children hospitalized for perforated appendicitis and appendiceal abscess indicates that in nearly all cases recovery is continuous. Rates do differ, allowing those who recover quickly to be discharged in three days, but others need longer hospitalization. All, however, will recover as completely at home as in the hospital, if the home can provide adequate hydration, adequate pain control, and control infection. Hydration and pain control issues are straightforward: either the child is able to eat or drink (and thus take oral pain medications), or intravenous fluids (and narcotics) must be administered at home. More research is needed to determine whether a two or three days of intravenous followed by oral antibiotics provides as good outcomes as 7-10 days of intravenous medications.

In conclusion, it is clear hospital stays after appendectomy in children can be significantly reduced without affecting quality of care. It is possible to approach the LOS goals proposed by Milliman and Robertson. However, those goals apply to ideal patients who have a rapid, complication-free recovery, no other confounding circumstances, and optimal home care. This is most likely in cases of uncomplicated appendicitis. Decreasing the LOS in complicated cases will require careful attention to the transition to home care and out-of-hospital follow-up. ❑

Continued

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Management of Lower Extremity Venous Stasis Ulcers in a Comprehensive Wound Care Clinic

William A. Marston, MD, Mark A. Farber, MD, John Bryant, SA, Jane Burns, RN, and Blair A. Keagy, MD

Venous insufficiency causes leg ulcers in about 1% of United States residents over age 60.[1] Venous insufficiency occurs because of lower extremity venous thrombosis or because of primary venous valvular dysfunction (allowing blood to reflux through incompetent valves, causing venous hypertension).[2] The result is increased capillary permeability, with leakage of large molecules (like fibrinogen) and leukocytes into the interstitium of the skin. If this impedes oxygen diffusion to tissue, the limb is predisposed to ulceration and poor healing.[3] Stasis ulcers may become extensive and may lead to severe infection and limb loss unless proper treatment is provided.[4,5]

A multispecialty group of physicians, nurses, and therapists at the University of North Carolina Wound Care Clinic has developed a protocol for outpatient treatment of these ulcers. The protocol emphasizes identifying and correcting venous hypertension whenever possible. The protocol has been refined progressively during the treatment of several hundred patients with venous ulceration over several years. We describe the results below.

Protocol

All patients with lower extremity ulcers undergo a complete history and physical examination to evaluate and distinguish the potential causes of ulceration (diabetic neuropathy, arterial insufficiency, trauma). Typically, venous stasis ulcers are shallow and irregularly shaped; there often is limb edema, hyperpigmentation, and a dry, scaly dermatitis. The ulcers tend to be located in the gaiter region of the lower leg (Figure 1, below). Patients who have no palpable pulses in the leg have their arterial supply evaluated. If arterial blood supply is thought to be inadequate for healing, revascularization is considered. Since several causes of ulceration may coexist, patients are evaluated for all common potential causes.

Evaluation for deep venous thrombosis is done on a selective basis. It is relatively rare for acute thrombosis and ulcers to coexist because ulceration is usually the result of years of venous insufficiency and swelling. If acute thrombosis is sus-

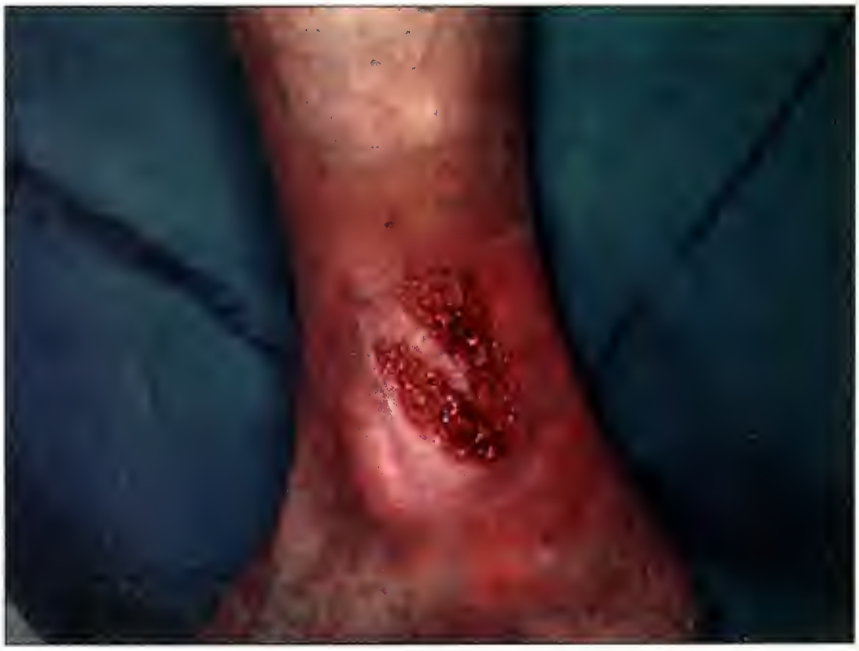

Fig 1: Venous stasis ulcer overlying medial maleolus of lower leg. This leg has been treated with compression wraps for two weeks, so much of the associated edema is resolved.

The authors are affiliated with the University of North Carolina Wound Care Clinic, Division of Vascular Surgery, Dept. of Surgery, UNC School of Medicine, Chapel Hill 27599.

pected, patients undergo venous duplex ultrasound scans; if scans are diagnostic, deep venous thrombosis is treated using standard protocols.

In the clinic, necrotic material is removed from all ulcers by sharp debridement under local anesthesia. This is continued until the ulcer base appears healthy. If there is an associated cellulitis, patients are admitted to the hospital and treated with intravenous antibiotics, leg elevation, and wound care until the cellulitis resolves (this has been necessary only in rare instances). It is important to distinguish true cellulitis from redness of the leg due to edema because the latter resolves as soon as the edema is controlled and does not require hospital admission.

Patients with normal blood supply who can tolerate compression treatment are given either a Profore compression boot (Smith & Nephew, Largo, FL) or an Unna boot (Domepaste, Miles, Inc., Elkhart, IN) with Coban compressive wrap (3M Co., St. Paul, MN) and a hydrocolloid wound cover. In preparation for the Profore boot, the ulcer is covered with a nonadherent dressing (or an absorptive substitute if the ulcer is draining heavily). A wool padding layer is wrapped from foot to knee, followed by a light, conformable bandage, both wrapped in a spiral. Then an elastic compression bandage is applied using a figure-8 technique. A final layer of compressive adherent gauze completes the wrap (Figure 2). This system was designed to provide optimal compression at the ankle to reduce peripheral edema, allowing improved oxygenation of the skin and promoting healing.[6]

Unna boots also provide compression to reduce limb swelling, but the amount of compression is more variable. The wound is covered with a hydrocolloid dressing or an absorptive dressing such as Allevyn (Smith & Nephew) to provide a moist healing environment for the ulcer. A paste bandage impregnated with zinc oxide is applied, followed by a Coban compressive layer (or an Ace wrap). Since fewer patients report pain when treated with the Profore system, we prefer Profore compression wraps to Unna boots. However, they may be difficult to maintain in the proper position on obese patients and those with very large lower legs. The paste in Unna boots provides some adherence to skin, allowing the boot to remain in position without slipping down the leg and losing adequate compression.

In patients with arterial insufficiency, compression therapy may cause severe pain and worsening of the ulcer. In these patients, we consider arterial revascularization to improve blood supply and allow adequate compression therapy to heal the ulcer. If revascularization is not possible, we use light compression and leg elevation to promote healing. Clearly these are difficult patients, requiring prolonged treatment to heal the ulcer. Patients with active infection should not be treated with compression boots until the infection is controlled.

Large ulcers with extensive drainage produce a characteristic odor. Absorptive dressings such as Sof-foam (Johnson & Johnson) or Allevyn (Smith & Nephew) placed over the ulcer under the compression boot can minimize the problem. The boot is changed as often as needed by the amount of drainage. Our goal is to prevent maceration of the skin surrounding the ulcer.

Patients are seen weekly in the Wound Care Clinic for ulcer debridement and dressing changes until leg edema is controlled and the ulcer is granulating adequately. They are then seen at

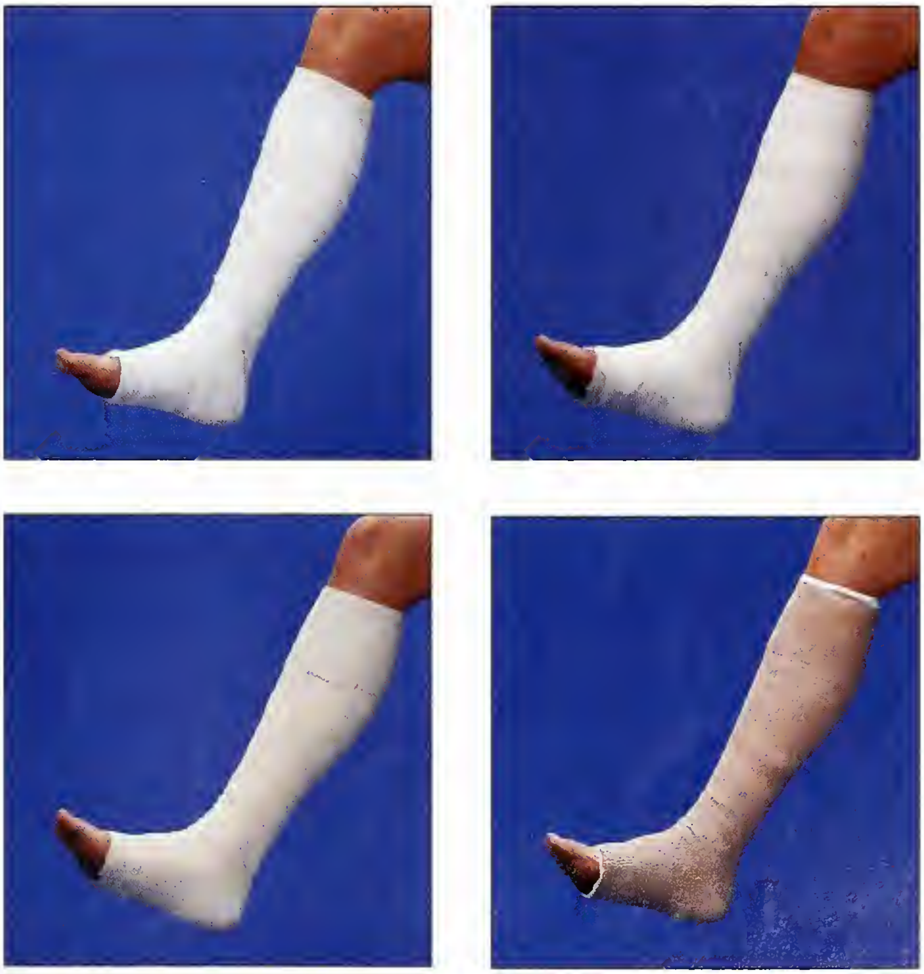

Fig 2: Layers of Profore compression wrap: layer 1—orthopedic wool, layer 2—light compression crepe bandage, layer 3—elastic compression bandage, layer 4—adherent compressive gauze wrap.

two- to four-week intervals until healed. Home health nurses or family members change the boot as often as needed between clinic visits (usually weekly unless there is excessive drainage).

At the time of initial evaluation, we photograph the ulcer and measure the initial ulcer size for later comparison. At all subsequent visits, size and wound characteristics are recorded to document the rate of healing.

Patients who are candidates for venous surgery are referred for venous duplex studies to identify the specific site(s) of venous reflux that lead to ulceration. Reflux may occur in one or more of the deep, the superficial, or the perforator venous systems. Patients who have superficial or perforator incompetence are offered vein stripping or ligation to correct the abnormal reflux. Patients with deep venous reflux are offered surgical correction only if they are good surgical candidates and have had severe recurrent ulceration. After ulcer healing or venous surgery, all patients are fitted for knee-high compression hose and taught how to apply and use them. They are asked to wear the hose at all times except when they are supine and the leg is elevated. The optimal compression hose are those that provide 40 mm hg of compression at the ankle.

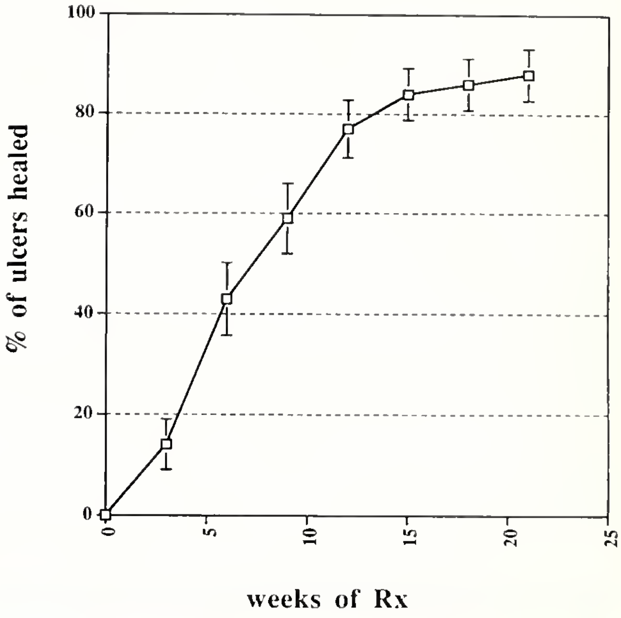

Fig 3: Life table curve illustrating percent of patients with healed ulcers vs time of treatment.

Results

Between July 1995, and March 1997, we evaluated and treated 130 patients using our protocol. The average age of patients was 62 years and 57% were women. The initial ulcer area averaged 23.2±5.0 cm^2 (range: 1-600 cm^2). Seventy-eight percent of patients were treated with Profore compression dressings, 18% with Unna boots, and 4% with other techniques. Ten patients were lost to follow-up and two died before completing 12 weeks of treatment. The remaining 118 patients (91%) were followed until healing or at least 12 weeks.

One hundred and twenty-one (93%) patients ultimately healed their ulcers, eight (6%) improved but are not yet healed, and one with a giant ulcer is essentially unchanged despite six months of treatment. There have been no amputations. Figure 3, above, shows a life table analysis of time to ulcer healing: 59% of ulcers were healed at 10 weeks and 78% at 16 weeks. The average initial size of the 10 ulcers requiring more than 26 weeks to heal was 126 cm.^{2} Figure 4, at right, shows a healed venous stasis ulcer.

Five patients required hospital admission for infection, two for split thickness skin grafts, and 15 for vascular procedures. Six patients had stripping of the greater or lesser saphenous veins, and four had ligation of perforator veins. Five patients required arterial revascularization.

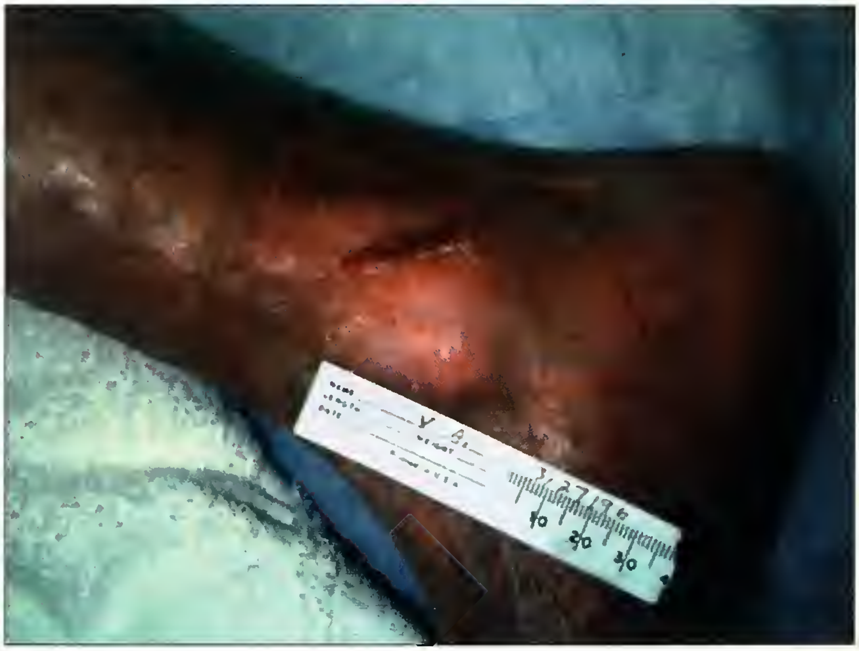

Fig 4: Complete healing of ulcer shown in Fig 1 after nine weeks of treatment with compression wraps.

Discussion

Venous stasis ulcers produce a debilitating chronic condition, which limits the affected patient's ability to walk, work, and be active.[7] Ulcers are associated with recurrent infections, and can lead to amputation in severe cases or if treated inappropriately. The cornerstone of treatment for venous ulcers is compression therapy using any of a number of techniques (compression hose, Unna boots, Profore compression wraps, intermittent pneumatic compression, and others). Without adequate compression, treatment with wound healing products, skin grafts, skin substitutes, and other techniques results in delayed healing or recurrent ulceration in most patients.

Using the protocol outlined, we have demonstrated that an outpatient program of comprehensive evaluation and treatment, emphasizing compression with Profore wraps or Unna boots, can reliably heal more than 90% of patients in a reasonably short time. Changing compression dressings weekly is cost-effective when compared to regimens using daily wound dressings.[8]

The initial size of the ulcer determines the time required for healing; most of the ulcers unhealed at 26 weeks were larger than 100 cm^2 initially. Patients who also have arterial insufficiency experience delayed healing unless they can be revascularized. We aggressively evaluate healthy patients for superficial and perforator vein incompetence because we feel that correction of venous reflux will limit ulcer recurrence, but we do not yet have solid proof that this is better than long-term use of compression hose. Limb loss from venous stasis ulcers should be very rare, unless there are associated problems such as arterial occlusive disease, diabetes, or severe congestive heart failure.

Patients treated according to protocols similar to ours can expect good results from noninvasive, outpatient treatment. In most cases, they can walk and return to their functional status. After the ulcer has healed, it is critically important to keep the patient in compression hose to minimize recurrent ulceration.[9] As always, extensive patient education is necessary to obtain compliance and good results and should occupy a prominent place in any treatment protocol. ❑

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NCMS 1998 Spring Conference & NCMS Foundation Leadership Symposium

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"Forging our Future in a Competitive Market: A Joint Conference of Physicians and Managers"

~ Preliminary Schedule ~

Wednesday, April 15

	Scientific Tobacco Policy Conference
11:45 am-12:45 pm	*Public Policy Discussions on Environmental Tobacco Smoke in NC,* luncheon
Noon -2:30 pm	Component Medical Society Executives
1 pm-2:45 pm	*Medicine and Science of Environmental Tobacco Smoke* Panel: Robert F. Perry, MD, Pee Dee Clinic, Wilmington (moderator); Michael Thun, MD, Director, Analytic Epidemiology, American Cancer Society; James Repace, PhD, Secondhand Smoke Consultant, Repace & Associates; Donald Shopland, Coordinator, Cancer Control Science Program, Natl. Cancer Institute
2:45 pm-3:15 pm	*Legal/Policy Issues Regarding Environmental Tobacco Smoke* Panel: Gregg M. Stave, MD, JD, MPH, Director, Corporate Health, GlaxoWellcome (moderator); Richard Daynard, Tobacco Liability Project, Boston University School of Law; Ann Dellinger, JD, Inst. of Government, UNC-Chapel Hill
3 pm-5 pm	Domestic Violence Committee
3:30 pm-5:15 pm	*Health Policy Research and Advocacy Opportunities to Reduce the Health Consequences of Environmental Tobacco Smoke* Moderator: Adam O. Goldstein, MD, UNC Department of Family Medicine
5:30 pm-6:15 pm	Conference Reception
6:15 pm-8:30 pm	Tobacco Control Committee/Dinner
7 pm-9 pm	NC Physicians Health Program Board of Directors Dinner Meeting

Thursday, April 16

	Joint Conference with NCMS and NC Medical Group Managers Association
7 am-8:30 am	AMA Delegation
8:30 am-10 am	*Physicians and Managers: Tough Choices & New Challenges* Thomas C. Royer, MD, Chair, Board of Governors, Senior VP, Medical Affairs, Henry Ford Medical Group, Detroit
10:30 am-Noon	*Building an Effective Team* Richard T. Hoerl, PhD, MPA, Hoerl & Associates, PC, Denver
12:30 pm-2:30 pm	Medical Education Committee
12:45 pm-2:30 pm	Injury Control Committee
2 pm-4:30 pm	Aging Committee
2 pm-4:30 pm	Coordinating Council of Specialty Soc.
2 pm-4:30 pm	Constitution & Bylaws Committee
2 pm-4:30 pm	Tort Reform Task Force
2 pm-4:30 pm	Communications Committee
2 pm-4:30 pm	Member. Servs. & Mktng. Committee
3 pm-5:30 pm	Children & Youth Committee
5:30 pm-7 pm	NCMS/NCMGMA Reception
8 pm-10 pm	Women's Health Committee
8 pm-10 pm	Finance Committee
8 pm-10 pm	NC Industrial Commission Liaison Cmte.

Friday, April 17

7 am-8 am	Executive Committee
8 am-10:30 am	Legislation Committee
8 am-10:30 am	Bioethics Committee
8 am-10:30 am	Substance Abuse Committee
8 am-Noon	*AMA-Physicians Accessing the Internet: An Introduction* David C. Kibbe, MD, MBA; Richard Scoville, PhD, Future HealthCare, Inc. *$60, limited seating for NCMS members only, advance registration required*
8:30 am-10:30 am	NCMS Foundation Gifts & Grants Committee
8:30 am-10:30 am	NCMS Foundation Finance Committee
11 am-1:30 pm	Mental Health Committee

11 am-1:30 pm	Prevention & Public Health Committee
11 am-1:30 pm	MEDPAC Board
11:30 am-2:30 pm	NCMS Foundation Board
1 pm-5 pm	*AMA-Physicians Accessing the Internet: the World Wide Web as a Clinical Resource: Advanced Internet Skills* David C. Kibbe, MD, MBA; Richard Scoville, PhD, Future HealthCare, Inc. *$60, limited seating for NCMS members only, advance registration required.*
2 pm-4:30 pm	Occupational & Environ. Health Cmte.
2 pm-4:30 pm	Managed Care Committee
2 pm-5 pm	Sesquicentennial Anniv. Task Force
4:30 pm-6 pm	Cancer Committee
4:30 pm-6 pm	Nominating Committee
5 pm-6 pm	Mediation Committee
6 pm-6:45 pm	**NCMS Foundation Leadership Symposium: Adapting to the Changing Role of the Physician** Keynote speaker: Emory Austin, CSP, CPAE, Emory Austin & Co., Mooresville
6:45 pm-7:30 pm	Reception: Honoring Young Physicians
Saturday, April 18	**NCMS Foundation Leadership Symposium: Adapting to the Changing Role of the Physician Under Managed Care**
7 am-8:30 am	Executive Committee
9 am-10:30 am	*Preserving the Role of the Caring Physician as an Employee of a System* Panel: Robert Bilbro, MD, President, Raleigh Medical Group; George Barrett, MD, Charlotte; John M. Lincourt, PhD, Director, Center for Prof. and Applied Ethics, UNC-Charlotte
10:45 am-12:15 pm	*Learning from Your Own Practice: Evidence-Based Medicine* Panel: Lawrence Smith, MD, Professor of Medicine, Mount Sinai School of Medicine; NYC, David C. Kibbe, MD, MBA, Future HealthCare, Inc., Chapel Hill
Noon-5 pm	Medical Students Section
12:15 pm-1:15 pm	NCMS Foundation Symposium Lunch
1:15 pm-2:30 pm	*Learning to Lead and Participate in a Team: A New Physician Role* Panel: Jeffrey Hummel, MD, Clinical Director, University of Washington Primary Care; E. Harvey Estes, Jr., MD, Associate Director, Kate B. Reynolds Community Practitioner Program
2:45 pm-4 pm	*Planning Medical Care for Populations at High Risk*, panel discussion Richard Hassett, MD, Medical Director, ACCORDANT, Greensboro
4:30 pm-6:30 pm	*North Carolina Medical Journal* Editorial Board

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CME Calendar

March 27-28
Neurology Update for the Primary Care Provider
Place: Hawthorne Inn & Conference Center, Winston-Salem
Credit: 11 hours Category 1, AMA; 11 hours AAFP
Fee: $150
Info: WFU School of Medicine, Office of Continuing Education, 336/716-4450 or 800/277-7654,
Internet: http://www.wfubmc.edu/education/cme

March 27-29
Clinical Infectious Disease: A Management Review for the Practicing Physician
Place: The Plaza Hotel, NYC
Credit: 18.75 Category 1, AMA
Fee: phys.: $545, phys.-in-training & allied health profs.: $400
Info: Center for Bio-Medical Communications, Inc., 201/385-8080, fax: 201/385-5650

March 27-29
Type 2 Diabetes Conference
Place: The Buttes Resort, Tempe, AZ
Info: presented by the American Diabetes Association and the National Institute of Diabetes and Digestive Kidney Disease; fax: 602/861-0542

March 31-April 1
Governor's Conference on Rural Health
Place: Greensboro
Info: NC Office of Rural Health and Resource Development, 311 Ashe Ave., Raleigh 27606

April 1-4
18th Annual Medical Communications & Health Reporting Conference
Place: Crowne Plaza Hotel, Phoenix, AZ
Info: Jill Stewart, AMA, 515 N. State St., Chicago, IL 60610, fax: 312/464-5843

April 3
Exploring Avenues for Nursing Success in Today's Marketplace: A Workshop for Registered Nurses
Place: Sheraton Imperial, Research Triangle Park
Credit: 6 hours, NCNA
Fee: $45 (NCNA members), $110 (nonmembers)
Info: NC Nurses Assn., 800/626-2153, 919/821-4250

April 4
2nd Annual Orthopaedics for Primary Care
Place: Durham County Hospital, Roxboro Road, Durham
Credit: 6.5 hours Category 1, AMA
Fee: $75
Info: sponsored by UNC School of Medicine and Wake AHEC; contact: Rosanne Cahalane, Wake AHEC, 3024 New Bern Ave., Raleigh 27610-1255, 919/250-8547, fax: 919/250-7963

April 15-18
NCMS Spring Conference & NCMS Foundation Leadership Symposium: "Forging Our Future in a Competitive Market: A Joint Conference of Physicians and Managers"
Place: Embassy Suites Hotel, Cary
Credit: 22 hours Category 1, AMA
Info: sponsored jointly by the Wake Forest University School of Medicine; contact Dana R. Hammermeister NCMS, 800/722-1350 or 919/833-3836,
Internet: http://www.ncmedsoc.org

April 22-26
Critical Care Medicine: 12th Annual Review & Update
Place: Crystal Gateway Marriott, Washington, DC
Credit: 39.25 hours Category 1, AMA
Fee: phys.: $795; phys.-in-training & allied health profs.: $575
Info: Center for Bio-Medical Communications, Inc., 201/385-8080, fax: 201/385-5650

April 24-May 1
57th Annual American Occupational Health Conference
Place: Hynes Convention Center, Boston, MA
Info: American Assn. of Occupational Health Nurses, 404/262-1162, ext. 110, or American College of Occupational and Environmental Medicine, 847/228-6850, ext. 152

April 29-May 2
International Conference on Physician Health
Place: Victoria, British Columbia
Info: sponsored by AMA and Canadian Medical Association. Contact: Elaine Tejcek, 312/464-5073, fax: 312/464-5841,
e-mail: elaine_tejcek@ama-assn.org

May 1
Silent Reflux & Diseases of the Upper and Lower Airway
Place: Babcock Auditorium, Wake Forest University School of Medicine, Winston-Salem
Credit: 6 hours Category 1, AMA
Fee: phys.: $195; NPs, PAs, residents: $135
Info: WFU School of Medicine, Office of Continuing Education, 336/716-4450 or 800/277-7654

May 13-15
Carolinas HealthCare System Spring Symposium
Place: Charlotte Convention Center
Credit: up to 24 hours Category 1, AMA
Info: Mary Anne Cox or Brenda Armes, CHS/Charlotte AHEC Office of CME, 1366 E. Morehead St., Charlotte 28204, 800/562-7314, 704/355-8631,
e-mail: www.symposium@carolinas.org,
Internet: www.carolinas.org/symposium/

Continued on next page

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FOR SALE: ENT/audiology office equipment, including audiology booth, ENG, ABR, Storz microscopes, Storz sinus endoscopes, NPL, SMR cabinets. Excellent condition. Call 704/846-7377 evenings.

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PSYCHIATRIST, JACKSONVILLE, NC: Full- or part-time, minimal managed care. Emerald Isle or Topsail Beach. Call Joe Colligan, MD, 910/455-5551.

CME Calendar

Continued

May 23
Race for Sound Beginnings 5K & 1 mile
Place: Research Triangle Park
Fee: $7, late fee $10
Info: Carolina Ear Research Institute, 3404 Wake Forest Road, Suite 301, Raleigh 27609, 919/876-4327 or 919/850-4327, *e-mail:* christa@health-web.com or mmiller@carolinaear.com

June 9-13
7th Annual Advanced Cardiovascular Interventions Symposium
Place: Westin Resort, Hilton Head, SC
Credit: up to 18 hours Category 1, AMA
Fee: $795
Info: Mary Anne Cox, CHS/Charlotte AHEC Office of CME, 1366 E. Morehead St., Charlotte 28204, 800/874-2417

July 3-5
NCMS Sports Medicine Symposium
Place: Sheraton Atlantic Beach Resort, Atlantic Beach
Info: Dana R. Hammermeister, NCMS, 800/722-1350 or 919/833-3836, *Internet:* http://www.ncmedsoc.org

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Don Henley, founder of The Walden Woods Project
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Aphorisms of the Month

Daniel J. Sexton, MD, Section Editor

"Assorted Quip & Barbs*"

All life is six to five against. —*Damon Runyon*

How little you know about the age you live in if you think that honey is sweeter than cash in hand. —*Ovid*

The only thing that saves us from the bureaucracy is its inefficiency. —*Eugene McCarthy*

It is inaccurate to say I hate everything. I am strongly in favor of common sense, common honesty, and common decency. That makes me forever ineligible for any public office. —*H.L. Mencken*

I would rather entrust the government of the United States to the first 400 people listed in the Boston telephone directory than the faculty of Harvard University. —*William F. Buckley, Jr.*

When men are pure, laws are useless; when men are corrupt, laws are broken. —*Benjamin Disraeli*

Old people shouldn't eat health foods. They need all the preservatives they can get. —*Robert Orben*

Be careful about reading health books. You may die of a misprint. —*Mark Twain*

By the time we've made it, we've had it. —*Malcolm Forbes*

Suppose you were an idiot and suppose you were a member of Congress. But I repeat myself. —*Mark Twain*

Few people know how to be old. —*La Rochefoucauld*

* *These quotes were chosen from a large supply of material kindly provided by Marvin Rozear, MD.*

Send aphorisms to Dr. Sexton at: Box 3605, Duke University Medical Center, Durham, NC 27710.
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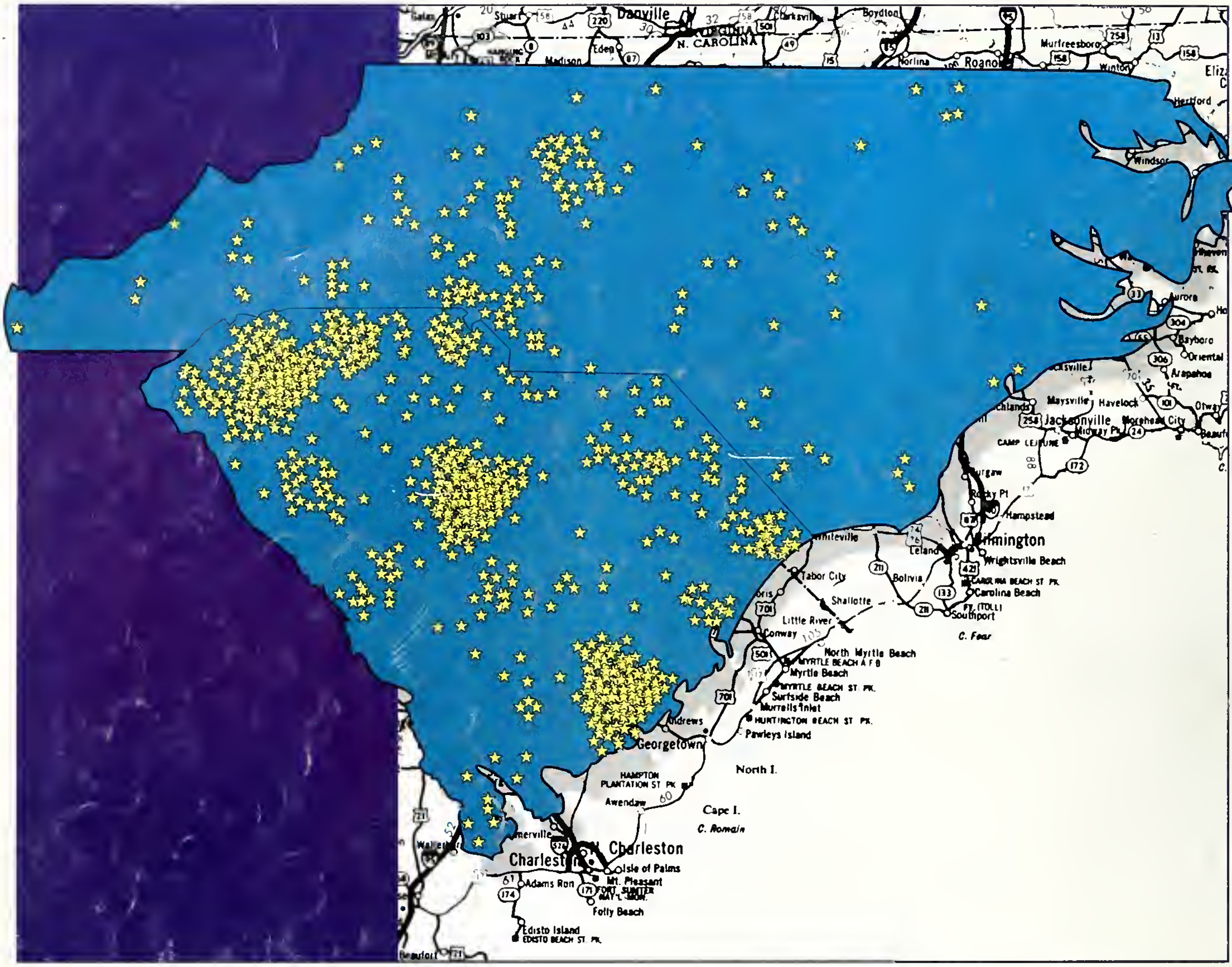

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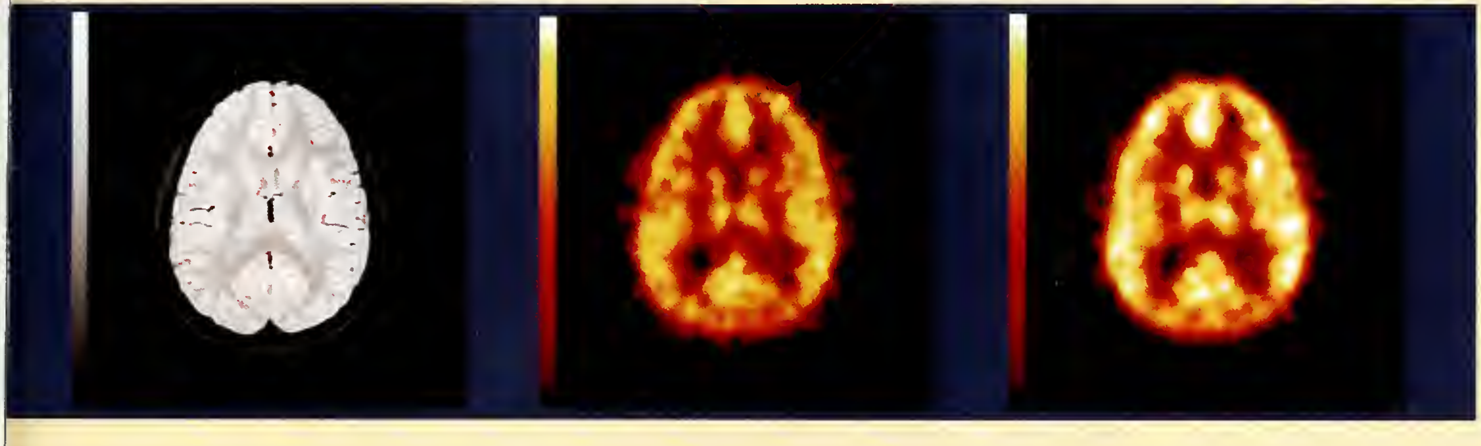

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Brain and Spirit

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Assad Meymandi, MD, and Roy J. Mathew, MD, Guest Editors

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North Carolina Medical Journal

FOR DOCTORS AND THEIR PATIENTS

May/June 1998, Volume 59, Number 3

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For Doctors and their Patients

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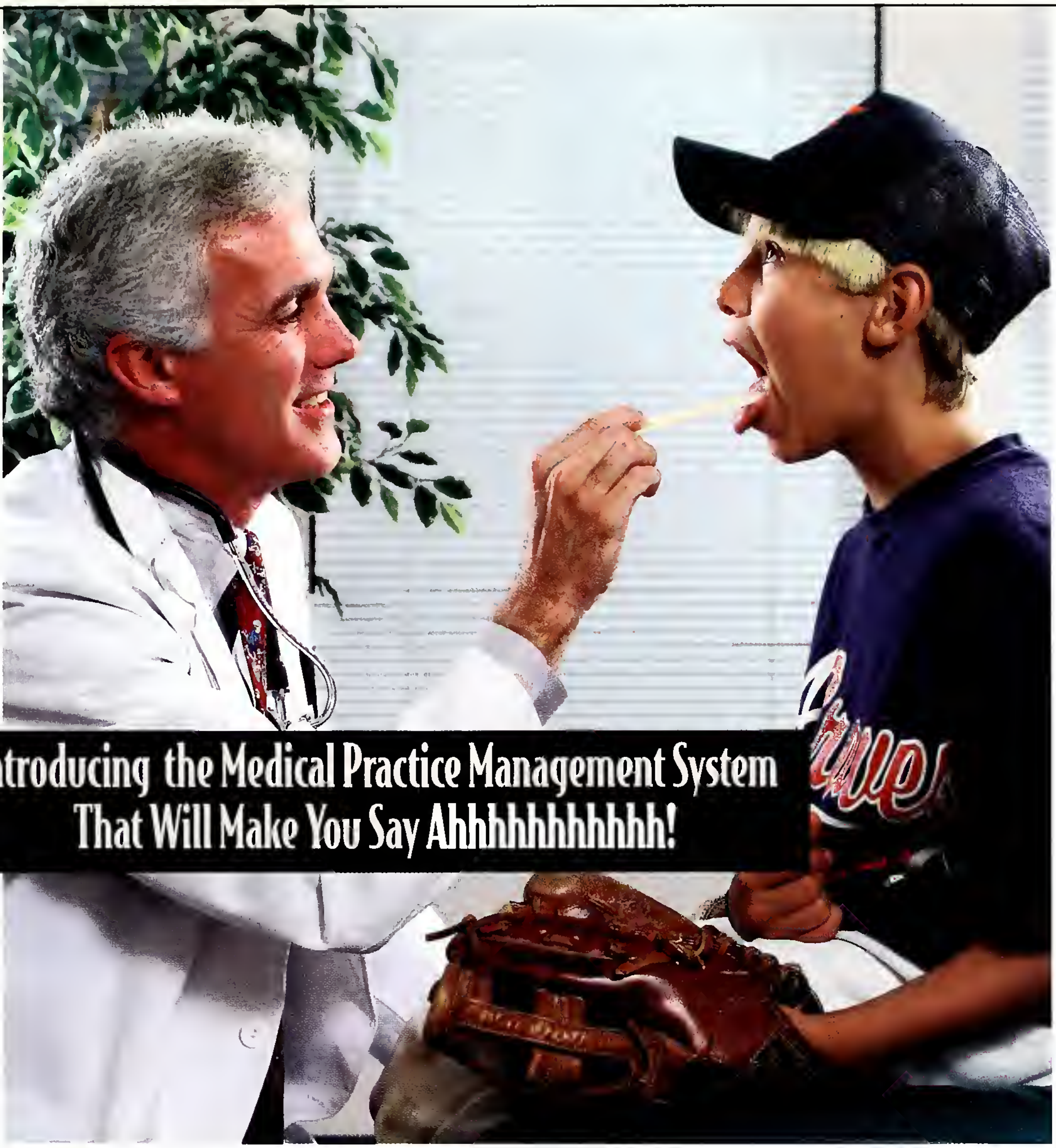

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Letters to the Editor

Perspectives on Religion, Death

To the Editor:

In the January/February Letters to the Editor column (NC Med J 1998;59:6), Dr. Assad Meymandi makes several statements concerning Zoroaster (Zarathrustra) and the religion that bears his name. Dr. Meymandi was responding to the *Journal* article "Children Are Not Supposed To Die" (NC Med J 1997;58:445-8).

Zoroaster's birth may have been as early as 1000 BC but it may have been later. It was certainly not before Abraham (around 2200 BC) or Moses (around 1600 BC). Jesus's birth was somewhere around 4 BC according to our best estimates, but Christians and Messianic Jews both know that Jesus has always been and always will exist. The date of his birth in Bethlehem is simply the time at which he came to earth for a brief span of about 33 years.

Zoroaster founded a religion that exists today and has some very excellent standards (e.g., honesty, the battle between good and evil, holiness). But God was known to many people before Zoroaster lived, so Zoroaster can hardly be credited with coining God's name.

I am uncertain what Zoroaster or his religion has to do with the idea that death, especially the death of a child, does not in some way represent a failure. As a Christian, I view any premature death as a failure. Death is my enemy. It has nothing to do with ego. I will not support physical life at all costs and in every situation, but neither will I yield meekly to physical death in a patient or a friend without letting it know it is very unwelcome.

Marion W. Griffin, MD
218-B Foust St.
Asheboro, NC 27203

Dr. Meymandi replies:

Scholarship on the life of Zoroaster/Zarathustra is, at best, controversial. Many Western references, including one by his ardent fan, philosopher Fredrich Nietzche, record Zoroaster's birth as 645 BC. Zoroaster was born in Ardabil, a city in northwest Persia—today's Iran. My father took me for a pilgrimage to Zoroaster's birthplace when I was four. I remember the impact of that experience.

I have read books in Farsi, Hindu, Arabic, Arameic, and of course English about Zoroaster and his religion, pockets of which still exist in Iran and India. I am amazed at the inaccuracies and perhaps inadvertant distortions about this ancient religion. Most Eastern references state that although Zoroaster's date of birth is unclear, it is closer to 3500 BC, since some of the writings of *Avesta*, Zoroaster's book, have been quoted in Egyptian hieroglyphics dated 3200 BC. Some of these references are made by the 14th-century Arab scholar, Ibn Khaldoun; eighth-century Persian scholar, Hussein ibn Ishagh; and Indian Zoroastrian priest, Dastur Darab. I can furnish a complete list of references if Dr. Griffin desires.

As to seeing premature death a defeat; it is a matter of personal view and opinion. The authorities I quote in my letter have instructed us otherwise. Dr. Griffin is a dedicated physician who sees death differently from the way I, or the scholars I quoted, do.

Assad Meymandi, MD, FAPA
3320/218 Executive Drive
Raleigh, NC 27609

Let's Keep Medicine Safe From "Intellectual Midgets"

To the Editor:

I comment on Dr. William Blythe's article in the November/December 1997 *Journal*, "Some Thoughts on Keeping Our Noble Profession Professional and Noble," (NC Med J 1997;58:424-6).

Dr. Blythe remarked that "…the trouble and danger [with clinical guidelines] is that they almost always become recipes in the hands of bureaucrats and intellectual midgets." When "intellectual midgets" control the flow of money any profession would be in grave danger, and ours certainly is. Some believe that medicine can be practiced by computer-generated algorithm, unaware that the art of medicine involves applying multiple algorithms to the complexities of each patient. They have no idea how near is the edge of human knowledge, and they don't recognize that good medical judgment often involves some ignorance. Many have postgraduate degrees (some even MDs) but merely by grasping their diplomas, they declare themselves educated and never think another thought or read another book.

The doctor's Golden Rule is to do unto the patient as one would do unto oneself. Contracting to act accordingly is the primary reason that physicians should be well compensated. Investor-owned organizations operate in their own self-interest; this is a different kind of contract entirely.

John R. Dykers, Jr., MD
P.O. Box 565, Siler City, NC 27344

Website Assists Aruba Physician

To the Editor:

In preparing for a lecture on Jet Ski injuries, I came across your excellent website and an abstract of “Injuries Associated with Personal Watercraft: An Emerging Epidemic in Need of Legislative Action,” (NC Med J 1997;58:284-7). Would you send me a full text copy of this article at your earliest convenience? Many thanks.

Percy J. Ho-Kang-You, MD
P Cormeillestraat 6
Oranjestad, Aruba
hohoho@setarnet.aw *via Internet*

From the Editor:

We were happy to provide a copy of the article. Our website certainly has extended the *Journal*'s readership.

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The Role of the Medical Profession in a Managed Care Environment
Response to Comments on the Bioethics Committee Statement

To the Editor:

I write in response to the March/April article, "The Role of the Medical Profession in a Managed Care Environment: Statement of the Bioethics Committee of the North Carolina Medical Society," (NC Med J 1998;59:96-100). The Committee's document caused much controversy indeed, and inspired our House of Delegates to "file" the report, in essence "expunging" it from the record. This seemed quite a surprising response from a supposedly "open" deliberative body. It forced me to ask, why did this occur? Why so much acrimony over an ethics document? The intensity of the negative responses indicates that the document struck close to the heart of the problem.

The document addresses a central issue facing American Medicine today: the relationship of doctor to patient. It strips away the current medical "double speak," which the discussants reiterate in their published criticisms. It also clarifies the professional schizophrenia of our medical leaders who ask us to serve in an impossible dual role—as traditional caregivers to our patients on one hand; as instruments of rationing for managed care companies and the government on the other.

Our fear of going unreimbursed, should we actually turn to patients for payment, leads us to assume the role of "double agent," but this is an untenable public posture and certain to lead to the end of professionalism as we know it. Dr. Glasson says the document is "radical." To the contrary, what is radical is American Medicine's support of the notion that physicians should be paid not by their patients but by organizations whose sole purpose is to limit the very services that doctors are supposed to provide. Has any other service industry placed itself in such an indefensible public position?

Organized medicine supports this exceptional payment scheme for physicians, and leads us further and further into the pit of professional oblivion. How much more must we sacrifice professionally by putting our collective heads into the third-party troughs? This professional position can only invite the rancor of the public—and because of our duplicitous "dual role," that anger will be deserved. We read more and more news articles about doctors who "withheld care for their own profit." This situation will only worsen if we continue to listen to Medicine's managed care sirens.

In essence, the Bioethics Committee document suggests one thing: that physicians should deal directly with patients about payment for "low cost" items in medical care. I marvel at the fact that physicians have been led so far down the third-party path that they will haggle with a third party for months over a $30 office visit charge that the patient could have paid at the time of the visit.

Our refusal as a profession to promote "high-deductible" insurance policies—which force doctors and patients to relate directly to one another in a market system—is a tacit admission either that we will not fulfill our historic promise to care for the poor, or that we do not fundamentally trust the value of our services in a true market, or that we do not trust our patients to recognize the value of our service and pay us accordingly. None of these positions is defensible or laudatory.

I believe that the poor could be helped enough with "high-deductible" insurance to end the current "hand out" of Medicaid and the parasitic bureaucracy that feeds on this system for its own benefit. Physicians have an obligation to take care of the poor. That obligation, however, should not force them to surrender their rights as citizens and or coerce them into systems that oppress professional intelligence, impair their freedom to evaluate and interact with patients, or arbitrarily manipulate reimbursement based more on the state budget than on the value of the medical services. We have sold ourselves into a system that demeans our value as persons and citizens. Its continuance will only stifle physician motivation and erode the remnants of professionalism to which we still cling.

I see the Medical Society's rejection of this document as an endorsement of the growth of the third-party system. This is inherently destructive of our profession. Let those who believe otherwise explain how medicine will maintain the public trust as we become instruments of managed care rationing. Have we so little regard for the public's intelligence that we think they won't find out what we are doing if we just don't tell them?

Our failure to promote "high-deductible" insurance—which is what the document supports—reveals our fundamental fear that we cannot survive economically in a direct economic relationship with our patients. Does this mean we really believe that our services are worth what Medicare pays us for them? Or would the "market" better reflect the "real" value of what we do? Do we trust our patients to recognize our value and pay us? What do we really believe would be the most just system: two people bargaining over the value of an encounter (remember for the poor, we serve *gratis*) or accepting some bureaucrats' idea of what our service is worth? Even more important, does medicine want to live in an artificial world that demeans its existence with every new payment "innovation"? I tremble at the coming intimidation and oppression of the "E and M codes."

The Bioethics Committee's document attempts an objective look at how Medicine has led us to the precarious professional precipice on which we find ourselves. The first step in curing any problem is to admit there is one. The only serious fault I see in the document is its unashamed candor. I do not think that we can incrementally introduce the emperor to the idea that he "has no clothes." Paul Revere might as well have said: "I think, maybe, the British are on their way."

James P. Weaver, MD
Bioethics Committee member, *Journal* associate editor
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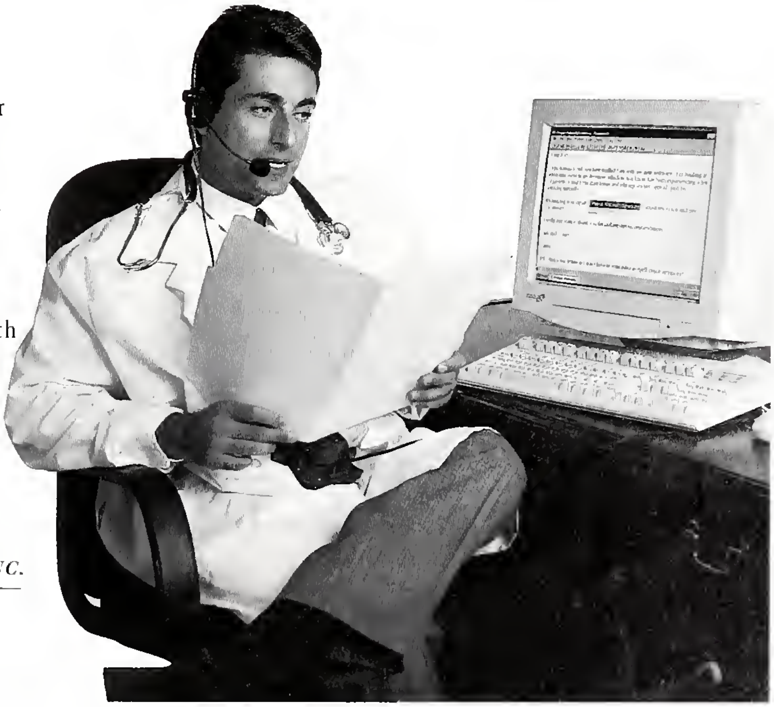

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What is the Office of Alternative Medicine and What Does It Do?

A Comment from OAM Director Wayne B. Jonas, MD

Edward C. Halperin's editorial in the January/February edition of the *North Carolina Medical Journal* says that the Office of Alternative Medicine (OAM) at the National Institutes of Health should be abolished (NC Med J 1998:59:21-6). He cites as justification for his opinion that the OAM was established by Congress (not scientists), that its activities are supervised by researchers with little experience, and that several of the topical areas it supports are not to his liking. Several accompanying comments expressed opinions contrary to Dr. Halperin's. Let me clarify how the OAM runs and the type of science it supports. This should put Dr. Halperin's "thinking physicians," both those who do and who do not support research on alternative medicine, at ease about the use of public funds for such purposes.

The Need for Research on Complementary and Alternative Medicine

There is a clear need for increased research activity that will provide accurate and high-quality information on complementary and alternative medicine (CAM). A great number of both the lay public and health professionals are interested in CAM. This includes the following:

- one out of every three Americans;[1,2]
- 80% of the world's population;[3-5]
- near 50% of patients with cancer[6] and HIV,[7]
- 50% of conventional physicians,[8] most of whom perceive CAM as having some efficacy;[9] and
- 80% of medical students.[10]

Despite such interest, the research funds spent on CAM in important areas like cancer are nearly 1000 times less than those spent on conventional medicine. This puts the public at risk from ineffective or incompetently delivered care,[12] drug toxicity,[13] contamination of products that have not been subjected to proper quality control,[14] and lack of information on safety and efficacy.

Because there is little infrastructure to support and develop research on CAM, most of what we know about these practices comes from small clinical trials or laboratory research done without a systematic strategy. Examples of this include research showing the benefit of herbal products in vascular and possibly Alzheimer's dementia,[15] benign prostatic hypertrophy,[16] and the prevention of heart disease.[17] Several randomized, placebo-controlled trials have shown that hypericum (St. John's wort) is as effective as conventional antidepressants in the treatment of depression, and with one-tenth the side effects and at one-third the cost.[18] There is research suggesting benefits for arthritis from homeopathy,[19] acupuncture,[20] vitamin and nutritional supplements,[21] herbal products,[22,23] diet therapies,[24] mind-body approaches,[25] and manipulation.[26] One can find a similar small studies for many other common conditions. A concerted research effort could evaluate therapeutic options in all these areas.

The Origin and Supervision of the OAM

Dr. Halperin questions the credibility of the origin and supervision of the OAM. Let me clarify these issues. In order to address the increasing need for research in complementary, alternative, and unconventional medical practices, Congress created the OAM at the NIH in 1992. The OAM is one of several programs within the Office of the Director at the NIH. Like OAM, the Office of Behavioral Science and Social Research, the Office of Disease Prevention, the Office for Research on Women's Health, the Office of Minority Health, the Office of Rare

---

Dr. Jonas is Director, Office of Alternative Medicine, National Institutes of Health, 9000 Rockville Pike, Bldg. 31, Room 5B38, Bethesda, MD 20892. His commentary continues the dialogue about alternative medicine that began in the January/February *Journal* and the March/April Letters to the Editor section. We welcome additional comments from our readers.

Diseases, and the Office of Dietary Supplements were created by Congress to provide specific research emphases. These offices work with existing Institutes and Centers at the NIH to supplement research activities, support new collaborative initiatives, and track, summarize, and encourage research in their mandated areas. The research itself is conducted through the Institutes responsible for the clinical or biological area under investigation. Thus, research initiated by the OAM is actually developed and executed by the NIH as a whole through its Institutes and Centers. The direct supervision of research on CAM lies in these Institutes and Centers, not the OAM.

In 1995, NIH Director Dr. Harold Varmus appointed a new director to the OAM, and positioned the Office under the supervision of Dr. Bill Harlan, associate director for Disease Prevention. The OAM director reorganized the Office into seven functional sections and hired new staff. Dr. Harlan has extensive experience in research and research management. Under his oversight, and with the support of specific projects by NIH Institutes and Centers, the OAM is becoming an effective and integral part of the NIH and the biomedical research community.

Challenges for Research in CAM

Research in CAM faces a number of challenges, some of which Dr. Halperin has pointed out. As in any fledgling area of investigation, few individuals or organizations have extensive experience researching CAM practices and products. Access to CAM literature is often difficult, and most conventional practitioners and researchers are not familiar with the information in that literature. Conventional research experience does not guarantee knowledge and competency in CAM. Too rapid a jump into new areas of research, without training and experience, runs the risk of erroneous or premature conclusions, like eminent scientist Linus Pauling's statements about the benefits of large doses of vitamin C. Dr. Halperin has extensive publications in his area of radiology, but his editorial in the *Journal* appears to be his first venture into CAM topics.

Publication difficulties are another challenge in CAM, as Dr. Halperin states. Research that falls outside accepted paradigms tends to be published in CAM journals, not conventional ones.[27] A study I conducted testing the homeopathic nosode hypothesis has been rejected by four immunology journals, usually because the topic or questions did not interest the editors, or the results were considered implausible or inexplicable. At the same time, four peer-reviewed journals that do have an interest in the topic have solicited the manuscript. Since it is a positive study, publication bias, which is even more of a problem in CAM than conventional medicine, would be fostered if I were to publish it in one of these journals.[28] Since these journals are not usually read by the immunologists who might attempt replication or reveal possible errors in the study, publication there is less than fully useful. The higher the quality the research, the more difficult it is to get it into the mainstream.

Activities of the OAM

To address the need for high quality research in CAM, the OAM supports research and training through a number of activities.

Research centers. So far, the OAM's largest investment in research goes to support 11 centers for CAM research at universities around the country. These centers focus on a clinical area and serve to build up capacity and experience in quality research. Areas being examined include the safety, efficacy, and mechanism of CAM practices for asthma, AIDS, cancer, pain (including arthritis and low back pain), addictions, hot flashes, aging, chiropractic medicine, and stroke.

Research grants. The Office works with NIH Institutes and Centers to identify and support CAM research applications for cofunding. It develops new "Requests for Applications" to solicit research applications in selected CAM-related areas. The Office has funded 42 developmental grants and cofunded with other Institutes 17 medium-sized grants. In addition, and in conjunction with the National Institute of Mental Health and the Office of Dietary Supplements, it is supporting a large multicenter clinical trial of the effect of St. John's wort on depression. In 1998, the OAM and the National Institute of Arthritis and Musculoskeletal Diseases will fund a large trial of the efficacy of acupuncture in osteoarthritis.

Objective research in CAM faces many challenges such as meager profit and patent potential, lack of objective markers, language and conceptual barriers, and threats to established theories and practices. Only a neutral party, such as the NIH, can address these. The OAM fosters this environment by always collaborating with both conventional and complementary communities.

Public information. The OAM supports a Public Information Clearinghouse and a media relations function. The Clearinghouse has a toll-free information line (888/644-6226); information specialists answer phone calls in English or Spanish, and provide information about current OAM research activities and sources for additional information about CAM. We receive more than 1300 contacts per month, including an average of 100 from the media.

Research bibliographic information. The OAM maintains an organized bibliographic database of more than 90,000 citations drawn from National Library of Medicine (NLM) and other electronic databases. A thesaurus of CAM-related terms is available to help physicians searching MEDLINE and other databases. A listing of randomized controlled trials from this database, organized by clinical condition, will soon be mounted on the OAM website.

Literature evaluation. The Office supports a Field Group in Complementary Medicine within the Cochrane Collaboration, an internationally respected group that produces and maintains systematic reviews of health care practices. In October 1995, OAM cosponsored a Consensus Development Conference on relaxation and behavioral approaches for pain and insomnia conducted by the Office of Medical Applications in Research at the NIH. A second conference on acupuncture took place in November 1997.

International liaison. The OAM is a World Health Organization Collaborating Center in Traditional Medicine and operates a listserv (TCAMNET) for facilitating communication about traditional medicine research worldwide. It supports surveys of traditional medicine use among Native Americans, and in Africa and South America. It is developing collaborative projects with several countries including Germany, China, Italy, and others.

Office operations. In addition to the calls received by the Clearinghouse, the OAM receives more than 800 letters, faxes, or electronic mail messages per month. These contacts come from a diverse group of constituencies.

Further Information

For information about CAM research at the NIH and grants:

- The Public Information Clearinghouse: 888/644-6226
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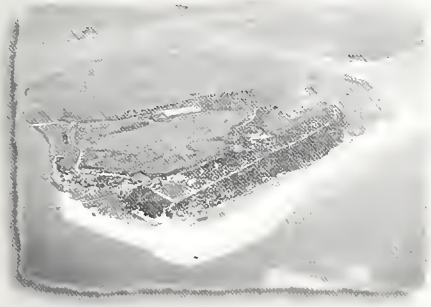

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Mind-Body Medicine

A Cautionary Note

Roy J. Mathew, MD

"The physician from the rehabilitation clinic said he had done all he could. He asked me to contact the Ayurvedic clinic." My brother was talking to me by telephone from India. Following surgical removal of an ependymoma from the cervical cord, he was getting physical therapy at the Rehabilitation Department of the Trivandrum Medical College for pain and weakness of the left arm. In the Kerala state of India, where my family live, most people—including the head of Rehabilitation Medicine—have deep-rooted faith in the therapeutic effectiveness of Ayurvedic massage with various medicinal oils. A few weeks later my brother told me that the massage therapy had not yet begun. I was amused to learn that according to the massage therapist, the intervention was effective only after the monsoon rains had ended. This explanation seemed acceptable to my brother, a lecturer in Economics. In all probability, it would have been acceptable to me as well years ago, before I left India.

What possible relationship could exist between the end of monsoons and massage therapy? Probably not even the therapist himself could give an answer. His conviction about such an association, one which his patients accepted wholeheartedly, could derive from the collective experiences of several generations. As a matter of fact, the entire system of Ayurvedic medicine is based on inferences and conclusions gleaned from observations passed down over generations. The Sanskrit word *Veda* (derived from *vid,* to know) means sacred knowledge. Ayurveda has never been considered pure science (shastra) like physics and chemistry. Founders of Ayurveda regarded life and death as more than physical phenomena, as extending beyond mere human logic and reason. Subjectivity and clinical intuition have a central role in Ayurvedic healing.

The beginnings of allopathy, if I may call Western medicine that, were very similar to Ayurveda. The common claim that scientific medicine began in Greece seems shortsighted since contemporaneously in ancient India the art of medicine was highly advanced. At the commencement of the Christian era, there were Sanskrit textbooks by Charak on medicine and Sushruta on surgery, although the system was founded much earlier by the legendary Dhanwantari. These books enumerate diseases and describe methods for their diagnosis and treatment. The surgical procedures described include amputations, abdominal delivery of babies, and cataract removal; a number of surgical instruments are specified for various procedures. Fumigation was used for wound sterilization. Surgical training included dissection of corpses.

In spite of having similar roots, Western medicine was led by industrialization and technology to develop along different lines. Objectivity and experimental verification, recognized and aided by rapid advances in physics and chemistry, became the touchstones. Allopathy made giant strides in both basic and applied fields. Unfortunately, objective Western medicine, while advancing the global field of medicine, eclipsed medicine's subjective, inferential, and holistic components. Objective findings and laboratory tests overshadowed clinical sense and intuition.

A Reliance on Intuitive Skills

Clinical intuition is much more than guesswork and caprice. It comprises many things, among them a physician's ability, at a level below full conscious awareness, to note, integrate, synthesize and draw conclusions from subtle clinical signs and symptoms. It enables an experienced physician to "smell" cancer even in the absence of firm evidence; it allows a psychiatrist to diagnose schizophrenia before the DSM IV criteria are fully met. It relies on the fact that the whole conveys information that differs from but is just as valuable as that provided by individual parts separately. Intuitive skills, neglected by contemporary Western medicine, are treasured by Ayurvedic practitioners as an invaluable clinical tool. Intuition is considered as important, reliable and useful as factual observation and ratiocination. Intuitive abilities are carefully nurtured and honed into a highly developed clinical skill on which both the physician and patients rely heavily.

Much of our so-called "alternative medicine" and many

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mind-body approaches to medical practice differ sharply from allopathic medicine in that they do not take quantitative studies and experimental verification as their exclusive basis. In recent years there has been a growing interest in incorporating alternative systems of medicine into clinical teaching and practice. A common objection to this is that the "alternates" must first pass the filter of objective verification before they can be accepted. Unfortunately, when these alternative systems are broken down into individual components (an essential of experimental verification), they cease to be alternative medicines and become caricatures of Western medicine. A flower taken apart is no longer a flower. Perhaps it would be better for Western medicine to recognize the importance of subjectivity in medical training and practice. As in art and music, subjectivity needs to be acknowledged, emphasized, and carefully developed.

Pondering the Need for Objective Proof

Do we need objective proof for everything? Do the splendor of sunsets, the beauty of a flower garden, the serenity of a baby's smile need to be proven? Are life and death physical phenomena to be regulated and regimented? Will the trimming, compression, and stretching necessary to fit it into the metrical pattern of an exact science not distort the very face of medicine? Human beings are not machines of human design, and healing is different from car repair. An ocean of difference separates the physician from the computer engineer. In spite of the march of technological progress, we still stand perplexed and confused at the bedside of many patients in pain, and find ourselves cudgeling our brains for a remedy to relieve their suffering. We still partake in the pleasure of birth and pain of death. We still rejoice with patients and weep with them. We still are vexed by the questions of meaning and purpose as those who went before us.

Why is the general public more and more interested in alternative medicines and mind-body issues when allopathic medicine has so much to offer? Perhaps because of unrealistic expectations, patients turn to alternative medicines looking for a magic bullet. Maybe they are frustrated by the impersonality of contemporary medicine; maybe they feel lost in a forest of laboratory tests and consultants; maybe they are angered by exorbitant medical bills; maybe they feel torn between caregivers and care-controllers. Maybe they long for a simpler, friendlier, and more nurturing system they can relate to. The term "alternative" unfortunately suggests fundamental differences and mutual exclusiveness, both of which are untrue. We should never lose sight of our beginnings or go astray bedazzled by technology. Perhaps what we need most acutely to change is not what we do but how and why we do it. Do we need a data-based study to verify this? ❑

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Spirituality and the Brain

Roy J. Mathew, MD

Giant strides in technology have led to prodigious feats in brain research. The impressive spacial resolution of magnetic resonance imaging (MRI) reveals fine anatomical details, but functional imaging techniques such as positron emission tomography (PET) and magnetic resonance spectroscopy (MRS) actually reveal information on how the living brain works. Together these techniques have revolutionized brain research and opened vistas in neurosciences. They have been applied extensively to the study of brain structure and function in health and disease.

Brain and Mind

The brain is the seat of all mental operations. The full spectrum of human experiences—fact and fantasy, sense and nonsense, logic and intuition—occurs within the gray folds of brain tissue.

In the past, the words "brain research" were applied only to the study of neurology, psychiatry, and conventional behavioral sciences. The seemingly limitless landscapes, the large expanses of misty, ill-defined regions we call "mind" seemed well beyond the bounds of objectivity and science. Our newly gained ability to study the living brain has allowed us to ask questions about regions that lie beyond the pale of conventional neurosciences. In this article I attempt to provide glimpses into brain mechanisms underlying experiences outside the realm of the ordinary, conventional, and mundane.

Somewhere within the human brain lies the power that spawned the glittering feats of science and technology that have changed not only the nature and quality of human life, but the whole planet Earth. Objectivity, logic, and scientific thinking are the cornerstones of modern life, but in spite of the meteoric progress science has brought to society at large, social problems of considerable magnitude remain: Crime, teenage pregnancy, alcoholism, and drug abuse top government agendas. Racial hatred and war are international problems. Deforestation and environmental pollution disfigure the face of the planet. Nuclear proliferation threatens life itself.

Alternative Medicine and Spirituality

Ironically, people in the very countries where science is most advanced are looking for alternatives to science. For example, there is a renewed interest in religion in this country. According to a recent poll, the number of US citizens who believe in angels is at a peak. The trend has affected scientific medicine as well, as shown by the recent upsurge of interest in alternative medicine, mind-body medicine, and spirituality. A 1993 study by Room and Greenfield[1] showed that 13% of the US population had at some time attended a meeting of a 12-step program, up 5% from the preceding year.

The 12 steps were first developed by Alcoholics Anonymous (AA) as a way to overcome addiction to alcohol. Bill Wilson, AA cofounder, said: "AA's 12 steps are a group of principles, spiritual in nature, which if practiced as a way of life, can expel the obsession to drink and enable the sufferer to become happily and usefully whole."[2] The AA, a lay body, was largely responsible for the introduction of spirituality, hitherto a concept relegated to philosophical thinking, into the world of medicine. The 12 steps of AA, which are designed to introduce and nurture a spiritual orientation, have become the single most popular and powerful component of substance abuse treatment. The Joint Commission on Health Care Organizations mandates a focus on spirituality in substance abuse treatment.

The AA philosophy extends well beyond the bounds of alcoholism. Other self-help groups (Debtors Anonymous, Emotions Anonymous, Gamblers Anonymous, Incest Survivors Anonymous, Nicotine Anonymous, Obsessive-Compulsive Anonymous, Overeaters Anonymous, Prostitutes Anonymous, Racism and Bigotry Anonymous, Smokers Anonymous, Workaholics Anonymous, and Chronic Fatigue Immune Dysfunction Syndrome Anonymous) are based on the 12 steps.

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Materialism and Spirituality

We know that behavior has neurophysiological corollaries, and spirituality is unlikely to be an exception. In that case, presently available neuroimaging techniques should shed some light onto the brain mechanisms that underlie spirituality. To explore this possibility, we must first understand what spirituality is.

Spiritualism is characteristic of systems of thought that affirm the existence of immaterial reality that is imperceptible to the senses.[3] So defined, spiritualism embraces an array of highly diversified philosophical views. It clearly applies to any philosophy that accepts notions of divinity, the immortality of the soul, or the immateriality of the intellect and will. The terms spiritualism and spirituality can be used interchangeably, but in the US, "spiritualist" commonly means a person who claims the ability to contact deceased people, conduct séances, and predict the future. AA, like most of us, prefers the term spirituality. To avoid confusion, I will use the term spirituality in place of spiritualism as defined by Encyclopedia Britannica.

Materialism, the polar opposite of spirituality, views all reality, including the human mind and will, as causally dependent on and reducible to physical process.[3] It asserts that humans are made up only of physical elements, that perceptual evidence is the only authority, that the brain is the basis of conscious awareness, that death is the end of all. Materialism admits of no world other than this; no heaven, no hell.

The concepts of materialism and spiritualism are as old as philosophy. Both concepts can be found in the *Rig Veda* (1500 BC),[4] the most ancient of Indian philosophical texts (described by Max Muller, the famous Orientalist, as "The first word spoken by the Aryan man"). Spirituality is closely intertwined and interspersed with religiosity, but there are important differences between the two. Unlike religiosity, spirituality does not assert the presence of a godhead and is devoid of the hierarchical structure and ritualistic practices that characterize most organized religions.

Quantification of Spirituality

Quantification is an absolute prerequisite to scientific investigation. Spirituality is no exception. Since spirituality has been defined and described since 1500 BC, it should be possible to quantify it as well. From the few available rating instruments, we chose the Mathew Materialism Spiritualism Scale (MMSS), an empirically derived, 96-item questionnaire developed by V. George Mathew at the University of Kerala, India. It measures six different subscales of the materialism-spiritualism dimension: God, religion, mysticism, spirits, character, and psi. *God* relates to belief in a higher power; *religion* examines the perceived value of religion and religious practices; *mysticism* evaluates belief in the genuineness of experiences such as visions, sense of presence, etc.; *spirits* studies belief in the survival of the soul after death; *character* evaluates ethical standards; and *psi* relates to belief in paranormal experiences like extrasensory perception and telepathy.[5,6]

Cultural and language problems made several items of the Indian version of MMSS difficult to comprehend. Therefore, we administered a modified version of MMSS to people in the US, in addition to more than 1000 people belonging to different religions and faiths, races, and cultures in India. The results were surprisingly similar in both countries: older people and females earned higher spirituality scores regardless of whether they were Christians, Jews, Hindus, Indians, or Americans. MMSS had high degrees of internal consistency (Cronbach's alpha 0.93) and in the US population showed a factor structure compatible with the subscales developed in India. In India, low-achieving, "problem" high school students had high materialism scores on the *character* subscale; people from lower-income groups and those belonging to larger families obtained high total spiritualism scores. Self-control and lack of impulsivity correlated positively with spirituality. Children were more spiritual than adolescents and adults. In the US, alcoholics showed highly significant increases in spirituality after recovery, and individuals diagnosed with alcoholism by the Michigan Alcoholism Screening Test (MAST) had lower spirituality scores than MAST-negative individuals (Table 1, next page).

Spirituality and Spiritual Experience

The MMSS treats spirituality as a lifestyle based on a belief system. Spirituality appears to be different from spiritual experience. In other words, believing in, even seeking, spiritual experience has to be differentiated from the experience itself. In many cases, including that of AA's Bill Wilson, a spiritual lifestyle followed a spiritual experience, but the converse is not uncommon. The origins of AA can be traced to Wilson's spiritual experience while hospitalized in New York for detoxification from alcohol.[7] Many individuals before and after Bill Wilson have provided detailed descriptions of such experiences.[8] Without exception, the experience, though ephemeral, is experienced as profound. Thereafter, individuals are "no longer the same," their belief systems and lifestyles changed forever in favor of spirituality. The most striking example is provided by the spiritual experience of the Apostle Paul. On the road to Damascus, Paul, a former persecutor of Christians, became a devout Christian. The process of sudden but total transformation is often described as a conversion experience. According to William James, "To say a man is converted means, in other terms, that religious ideas, previously peripheral in his consciousness, now take a central place, and that religious aims form the habitual center of his energy."[8] The spiritual experience appears to be the center and the hub, with spirituality being either a quest for that experience or the result of it. According to AA, the experience does not have to be unexpected and thunderous; a more gradual and sustained variety, the educational type, is also recognized.[9]

Table 1. Comparisons of Materialism Spiritualism Scale (MSS) scores* in recovering alcoholics (Before and After recovery) and in individuals screened by the Michigan Alcoholism Screening Test (MAST)

MSS Component	Recovering Alcoholics Before	After	p≤	MAST Screening Results Negative	Positive	p≤
God	31.0 ± 7.6	23.2 ± 10.2	.001	30.5 ± 5.1	26.1 ± 7.9	.018
Religion	28.9 ± 6.8	24.7 ± 8.3	.001	28.9 ± 5.4	28.6 ± 7.9	ns
Mysticism	29.4 ± 6.8	23.6 ± 7.3	.001	25.8 ± 5.3	23.8 ± 7.8	ns
Spirits	20.0 ± 7.6	18.1 ± 7.0	.012	20.8 ± 6.6	19.9 ± 5.8	ns
Character	63.1 ± 12.9	49.7 ± 15.6	.001	60.0 ± 8.5	54.1 ± 13.1	.05
Psi	30.1 ± 6.4	28.8 ± 9.1	ns	29.7 ± 8.6	30.1 ± 11.0	ns

* Mean score ± Standard Deviation. Significance of (p) differences in means calculated by t-test.

Laboratory Study of Spiritual Experiences

If we accept the notion that a living brain is prerequisite to human experience, it seems reasonable to also assume that some physiological changes must accompany spiritual experience. Since, to the best of our knowledge, spiritual experiences are exclusively human, animal research does not apply. Spiritual experiences are hard to come by and difficult, if not impossible, to engineer. Thus, laboratory study of such an experience is out of the question. However, individuals seeking spiritual experiences use a number of techniques believed to produce or enhance spiritual ecstasy. Some of these can be reproduced in a laboratory setting.

Art is closely and intimately related to religion, if not with spirituality. Music is an important component of worship in all major religions. Some of the best paintings in the world are found in churches, temples, and mosques. St. Peter's Cathedral in Rome exemplifies this vividly. Exquisite stone carvings adorn Hindu and Buddhist temples. Many ancient religious texts take the form of poems. The *Holy Koran*, in addition to its philosophical depth, is renowned for its poetic beauty. *Rig Veda*, the ancient Indian philosophical text, consists of hymns. In India, almost all classical dance forms originated as temple arts. The Sufis, Moslem mystics, use dance as a means for spiritual experience. Tribal dancing leads to altered states of mind in less modernized societies. It seems safe to conclude that the exhilaration that accompanies aesthetic enjoyment is akin to, if not identical with spiritual bliss.

We developed a rating instrument (the "Cognitive Patterns Questionnaire") to measure ability to experience and express emotions; enjoyment of music, art, and poetry; emotional responses to music, movies, novels, and poetry; ability to enjoy scenery, etc. We administered the questionnaire to 61 volunteers and correlated their scores on this questionnaire with their spirituality scores.[6] The results (Table 2, next page) indicated a close association between art and spirituality.

There is a marked degree of functional asymmetry of the two cerebral hemispheres of the human brain. In most individuals, the left hemisphere is the primary mediator of verbal/linguistic functions. The numeric symbol system and complex voluntary movements are usually located in the left hemisphere, whereas nonverbal and spacial functions are primarily located in the right hemisphere. The left hemisphere uses linear, analytical, serial, and detailed strategies, while the right (nondominant) hemisphere uses strategies that are holistic, synthetic, and configurational. Spoken language, numerical skills, written language, science, logic, reasoning, temporal and sequential information processing, attention to details, are left hemispheric functions; three-dimensional forms, imagination, emotional and melodic speech, intuition, perception of environmental sounds and scenes, social/emotional nuances, are mostly right hemisphere functions.[10]

Art and music have been assigned to the right hemisphere, but on close examination, it is apparent that no single hemisphere is entirely dominant for music. Lesions of the nondominant hemisphere can produce deficits in musical tasks, but certain components of music (functions involving an analytical aspect) reside in the dominant hemisphere.[11] In the normal brain, cerebral blood flow (CBF) and metabolic rate (CMR) are closely tied to brain function.[12] These two measures

Table 2. Mean values for cognitive pattern scale for all subjects; recovered alcoholics pre- vs post-recovery scores

			Pre	Post	p≤
1.	Recognize positive emotions in other people?	Mean	2.0484	3.3226	≤ .001
		SD	1.015	.647	
2.	Recognize negative emotions in other people?	Mean	2.6774	3.3548	≤ .001
		SD	.988	.680	
3.	Recognize your own positive emotions?	Mean	1.7581	3.2742	≤ .001
		SD	1.082	.682	
4.	Recognize your own negative emotions?	Mean	2.1452	3.2903	≤ .001
		SD	1.069	.687	
5.	Express your positive emotions?	Mean	1.6613	3.0323	≤ .001
		SD	1.055	.829	
6.	Express your negative emotions?	Mean	1.9677	2.7097	≤ .001
		SD	1.293	.818	
7.	Deal with positive emotions expressed by others?	Mean	1.8525	2.9672	≤ .001
		SD	1.093	.752	
8.	Deal with negative emotions expressed by others?	Mean	1.3065	2.4839	≤ .001
		SD	1.065	.919	
9.	Ability to enjoy music?	Mean	2.7903	3.4032	≤ .001
		SD	.960	.689	
10.	Ability to enjoy art?	Mean	1.9333	2.7833	≤ .001
		SD	1.163	1.027	
11.	Ability to enjoy poetry?	Mean	1.5968	2.6452	≤ .001
		SD	1.137	1.103	
12.	Your artistic abilities?	Mean	1.3226	2.1613	≤ .001
		SD	1.238	1.204	
13.	Does music make you feel emotional?	Mean	2.8689	3.2295	≤ .001
		SD	.957	.761	
14.	Do movies make you emotional?	Mean	2.5323	2.9516	≤ .001
		SD	.936	.838	
15.	Do paintings make you emotional?	Mean	1.4839	2.1774	≤ .001
		SD	1.020	1.167	
16.	To what extent do novels /poetry make you emotional?	Mean	1.8333	2.6000	≤ .001
		SD	1.137	1.045	
17.	Observing and responding to details of…	Mean	1.8361	3.1803	≤ .001
	a. scenery while driving?	SD	1.098	.695	
	b. sensations while taking a hot bath?	Mean	1.7869	3.2131	≤ .001
		SD	1.035	.661	
	c. feelings of intimacy and love while having sex?	Mean	1.7627	3.1186	≤ .001
		SD	1.179	.853	
18.	Ability in recognizing faces of…	Mean	2.5574	3.1967	≤ .001
	a. your own race?	SD	.940	.679	
	b. other races?	Mean	2.0000	2.8000	≤ .001
		SD	1.074	.840	
19.	Ability to remember faces of…	Mean	2.3770	3.0984	≤ .001
	a. your own race?	SD	.986	.851	
	b. other races?	Mean	1.9500	2.6833	≤ .001
		SD	1.126	.983	

may be used as indices of regional brain activity. In human subjects, CBF and CMR can be measured noninvasively using positron emission tomography (PET). PET studies carried out at UCLA showed that nonanalytic enjoyment of music is associated with activity in the nondominant hemisphere, while technical analysis of music involves the dominant hemisphere.

Using PET, we measured CBF changes associated with enjoyment of music. We compared PET scans obtained while four subjects, age 20-25, listened to music or to white noise. As expected, subjects reported significantly more pleasure from listening to music. Listening to music increased CBF in the lateral sulcus (possibly the insula), especially of the nondominant hemisphere (Figure 2, at right, top). For comparison, we measured CBF while the subjects solved mathematical problems, with and without monetary reward for correct answers. As expected, a reward made mathematical tasks more pleasurable, but the CBF increase was more marked in the dominant left hemisphere (Figure 3, at right, bottom). This study indicates that the pleasure associated with mathematical tasks and with music change CBF in different brain regions, and that listening to music significantly increases right hemisphere activity. Still, it is extremely difficult to make qualitative comparisons between the pleasure associated with money-making and musical enjoyment.

Marijuana and Spiritual Experience

Since ancient times, people seeking spiritual enlightenment have alter their consciousness with drugs and potions. *Rig Veda* vividly documents the use and effects of soma (*Amanita muscaria*).[4,13] Other drugs include water lily (*Nymphaea caerulea*), mandrake (*Mandragora officinarum*), the opium poppy (*Paper somniferum*), morning glory (*Turbina corymbrosa*), parican in Brazil (*Virola*), ibogane in Central and West Africa (*Tabernathe iboga*), and peyote in Mexico (*Lephophora williamsii*).[14-16] Marijuana (*Cannabis sativa*) has been used in religious rituals of several ancient cultures including Assyrians, Egyptians, Scythians, Jews, Persians, and Indians. Jacques-Joseph Moreau,

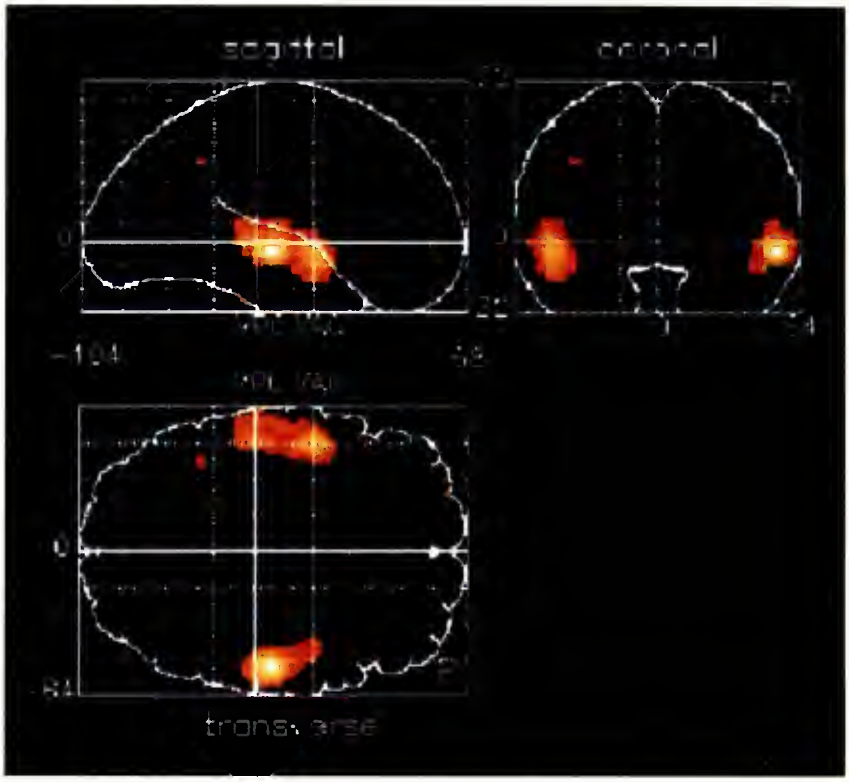

Fig 2: Increase in cerebral blood flow while listening to music compared to listening to white noise, averaged across all participants.

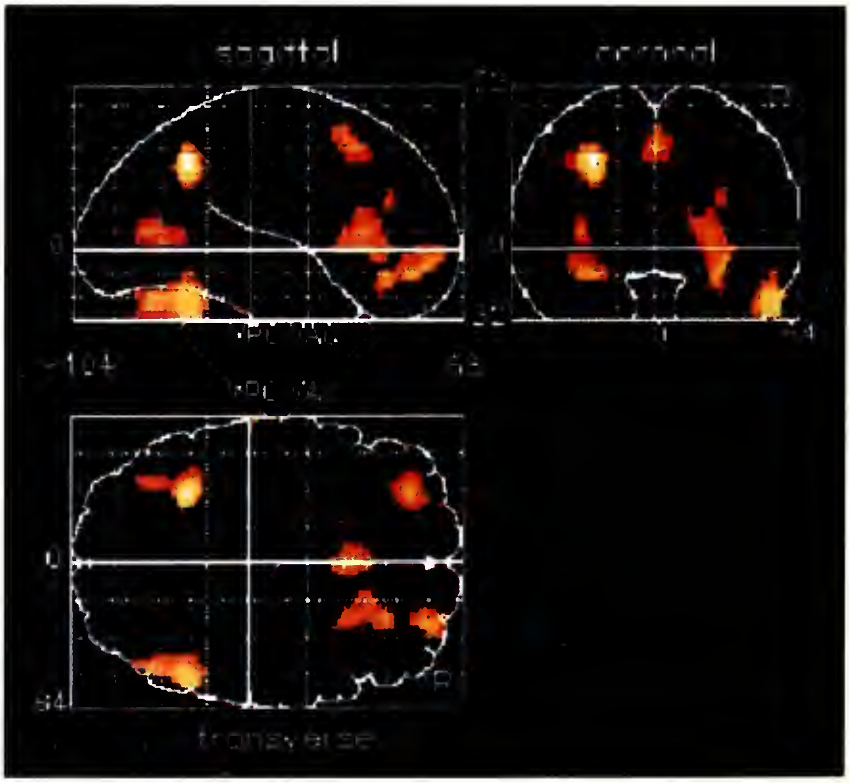

Fig 3: Increase in cerebral blood flow while solving mathematical problems for monetary reward compared to solving problems without monetary reward, averaged across all participants.

the 19th-century French physician, provided explicit descriptions of marijuana intoxication: "It is a feeling of physical and mental comfort, of inner satisfaction, of intimate joy…it is really happiness that hashish gives, and by that I mean totally mental joy, not at all sensual, as one might be tempted to believe."[17]

Over the years, we have conducted a number of experiments on how marijuana intoxication effects brain function. Recently, we examined the effects of tetrahydrocannabinol (THC), an active ingredient of cannabis, on CBF measured by PET. Fifty-nine normal, right-handed volunteers with a previous history of marijuana exposure participated in the study. Following a PET scan under resting conditions, subjects received a 20-minute intravenous infusion of human albumin or of one of two doses of THC suspended in human albumin, given under double-blind conditions. Scans were repeated at 30, 60, 90, and 120 minutes after the start of the infusion. Degree of intoxication was quantified with an Analogue Intoxication Scale and other drug-induced phenomena were quantified with other rating instruments. After THC infusion, global CBF increased, but the most obvious changes were seen in the right, nondominant hemisphere. We found an anterior/posterior gradient in the ratio of frontal lobe CBF to occipital lobe CBF. This ratio increased significantly after THC administration, indicating an increase in frontal compared to occipital flow.

Development of the frontal lobes differentiates human brains from those of primates and other species. The behavioral and intellectual characteristics that separate humans from animals are, to a considerable extent, based in the frontal lobes. Aggression and procreation are behaviors that ensure survival of a species, and eating and elimination ensure survival of individual organisms. These functions, which humans share with animals, are mediated by phylogenetically old brain regions. The frontal lobes provide partial control over these more primitive functions, and are primarily responsible for goal-directed behavior. Humans, having greater frontal development, exercise greater control over the more primitive functions and are able to delay gratification to a greater extent.[18-20]

The frontal regions are involved in consciousness itself. Consciousness, the awareness of self and surroundings, forms a continuum ranging from coma at one extreme to excitement at the other. The neurophysiologic substrate for consciousness is often described as arousal. The reticular activating system, a network of neurons in the brain stem (the phylogenetically oldest part of the brain) mediates arousal. The reticular activating system is connected to more recently evolved parts of the brain such as the limbic system and the frontal cortex (the cortical representation of the arousal chain). Activation of the arousal chain involves activation of each of its components with their accompanying manifestations.[21-23] Organisms occupying different rungs on the evolutionary ladder have different components in their arousal chain. Lower species such as reptiles use only rudimentary limbic systems; humans have the most marked frontal development. Since arousal involves activation of the various components of the arousal chain, the quality of consciousness is likely to differ by species. In humans, consciousness is likely to involve emotions (via the limbic system), and heightened attention and concentration (via frontal activation).

Volitional, goal-directed behavior is definitely associated with the dominant cerebral hemisphere; nonvolitional, goal-directed activity—activities that have become second nature and do not call for conscious effort, such as getting dressed, brushing teeth, driving to work, etc.—is believed to be a nondominant function.[10] Playing music is a nonvolitional activity. As a matter of fact, good musicians disengage their conscious attention to let the music "flow."

For ordinary states of awareness, the volitional aspect of self is central. Indeed, anesthetizing the dominant hemisphere by injecting sodium amytal into the corresponding internal carotid artery causes marked impairment of consciousness.[24-26] This suggests that activation of the dominant frontal lobe might augment the sense of volitional control, but what might happen when the nondominant hemisphere is activated? Since THC activates the nondominant frontal lobe, study of THC-induced mental states may give us an answer. Most subjects find this state of mind to be peaceful and relaxing, but it is extremely difficult for subjects to put the experience into words. The ineffability associated with a nondominant hemispheric experience probably results from the localization of spoken speech and written language in the dominant hemisphere.

> "Consciousness…forms a continuum ranging from coma at one extreme to excitement at the other. The neurophysiologic substrate for consciousness is often described as arousal."

Transcendence of time and space and ineffability are characteristics of mystical states. We conducted additional experiments with THC that confirm previous reports of loss of time sense and impaired spatial abilities after marijuana use.[27,28] I point out that loss of time and space sense are also associated with total engrossment in an aesthetic experience such as listening to music or enjoying a painting. These experiences are accompanied by loss of self in the totality of the experience. Holism is a nondominant hemispheric characteristic.

The nondominant hemisphere is quite possibly involved in mystical experiences. Mystical experiences that occur as epileptic aura seem to originate from the right (nondominant in right-handed individuals) side of the brain. Similarly, functional asymmetry in favor of the nondominant hemisphere is thought to underlie psychic experiences that follow head injury. Experiences of precognition and clairvoyance have been associated with right hemispheric damage.[29]

The Significance of Dominant and Nondominant Hemispheres

Functional hemispheric differentiation is primarily a characteristic of the human brain although rudiments can be found in other species as well.[10] Presumably, asymmetry allows the evolution of the panoply of capabilities and characteristics that make humans the fittest and most masterful of species. Development of linguistic capabilities in the left cerebral hemisphere allows humans to communicate and consolidate their identity as a group. The ability to share information, even across generations, definitely contributes to the accumulation of knowledge and intelligence. The left hemisphere also generates the ability to reason, and produces the linear functions of separation and quantitation, which form the foundations of scientific thinking. In fact, the technological progress of the past 5000 years or so can be attributed primarily to the working of the dominant hemisphere.

The dominant hemisphere of the brain sorts out; the nondominant one sums up. Egoism and its accompanying smallness and selfishness seem to result from activity of the dominant orientation that emphasizes separation and division. Dissolution and disruption of the family—so lamented by sociologists—can be traced, in part, to egoism. On the other hand, concern for the environment depends on the ability to feel compassion for other creatures. This nondominant function is probably the most potent defense against nuclear war.

It is difficult to explain why nondominant functions, which are more developed in humans, should appear so late in the evolutionary process. Is the ability to appreciate music, lose oneself in a panorama, or feel connected a need or a luxury? At first glance, these functions appear to have minimal survival value. Therefore, it is difficult to explain their appearance based on evolutionary theory. Perhaps the nondominant hemisphere is just an epiphenomenon, and development of the dominant hemisphere is the significant event. Perhaps the nondominant hemisphere reflects our earlier nomadic existence. I would argue that life under the threat of nuclear holocaust gives the nondominant hemisphere function tremendous survival value. Perhaps what we need is a hemispheric role reversal. ❑

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Chaos

A Mathematics for Heart and Mind

Earl R. Mac Cormac, PhD, and Collin J. McKinney, VI

If asked to describe the role of mathematics in medicine, most of us would cite the use of statistics to assess the efficacy of treatment (as in drug trials), or the production of tomographic images from radiographic scanners (CT, MRI, PET), or the mathematical simulation of biological processes important to basic scientific investigation (such as membrane transport, neuronal electrical activity, etc). Until recently, however, most doctors would not see much value for mathematics in diagnosing disease or in choosing specific therapies. This situation may be changing because chaos theory provides medicine with some startling new insights. In this article we will attempt to: 1) present an introduction to the concepts of chaos theory; 2) identify the fascinating results of some applications of chaos theory to medicine; and 3) outline our investigations into normal and diseased brain processes using chaos theory. The introduction of mathematics into the clinical process represents a major step toward using the mind to control the body. By solving medical problems through computer-assisted computation, the physician's ability to diagnose and treat will be greatly enhanced.

Chaos Theory

The word "chaos," as used here, does not mean complete and utter disorder, but rather mathematical complexity, which at times produces "seeming" disorder and at other times, "seeming" order. Most of the mathematical formulas of chaos theory have been well known for a long time, but only recently have they been called "chaotic." Why? The newness of chaos theory arises from the advent of computers that enable millions of iterations of a formula. By "iteration" we mean putting the nth result of an equation back into the formula to generate an n+1 result; the n+1 result is then put back into the same formula to produce an n+2 result; and so on. Producing millions of iterations with a computer can lead to unexpected results in which complex formulae suddenly move from stable results to unstable results—hence, "chaos."

Chaos theory has been used to describe how laminar (smooth) flow changes to turbulent flow in aerodynamics. Iteration of one complex formula shows how a slight change in atmospheric pressure or wind speed can throw an airplane into unexpected turbulence. Before the advent of chaos theory, aerodynamic engineers thought there were two different conditions, laminar flow and turbulence, which could not be directly related or described by a single equation. Now they think in terms of perturbations of values (often very slight) in one equation that move a flight from laminar to turbulent flow. How small a perturbation is needed? An often-quoted example is that of a butterfly fluttering its wings in China and changing weather systems in North America.

The formulae of chaos theory are deterministic, but because of their complexity, outcomes cannot be predicted until iterations have been calculated from a specific set of initial conditions. A vast number of iterations, using all possible perturbations of values, is needed to predict the outcome of any particular combination of factors.

The human body, especially in its interaction with the mind, is an extraordinarily complex system. Chaos theory offers some interesting possibilities for thinking about the body in terms of diagnosis and therapy. For example, discovering mathematical formulae that describe the operation of the heart might give physicians a whole series of options for positive intervention. Chaos theory might allow doctors to accurately prescribe changes in behavior (such as exercise), or changes in diet, or the use of drugs to regulate the heartbeat or lower blood pressure. Indeed, it might be possible to accurately recommend one, or a combination of some or all such interventions. Furthermore, the effects of proposed interventions could be tested by computer simulation before being applied to the patient.

Pre-intervention computer simulations would put physicians in a better position than pilots who, encountering unexpected turbulence, must rely on a series of trial-and-error changes in flight speed, altitude, or course. At present, physicians, too, operate by trial-and-error, intervening first in one

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way (say, a change in behavior), and if that doesn't succeed, resorting to one drug, then another, and so forth. Chaos technology would enable physicians to understand individual patients and how various interventions can succeed in one person but not another because of tiny differences (perturbations) that affect the outcome of chaotic situations. We should not, however, underestimate the difficulty of discovering the mathematical formulae that govern the operation of even so regular an organ as the heart. And we will need investigations of not just the heart, but also of the extremely complex systems involving the brain (which influences heartbeat and rhythm), of the role of stress, and probably of the genetic traits that humans inherit. Before we present evidence that the search for chaos theory formulae has already begun and achieved beginning success in the study of the heart and the brain, we must introduce two more concepts of chaos theory: fractals and symmetry.

Fractals. Fractals refer to a form of geometry whose dimensions need not be integers. In traditional Euclidean geometry, a point or a line has one dimension, a plane has two, and solids have three. Fractal geometry can have dimensions of 0.5, 0.6, 0.7, or 1.3, 1.6, or 2.5, 2.9, etc. These nonintegral dimensions produce jagged shapes that many believe reflect the forms of nature better than the smooth circles and straight lines of Euclidean geometry. Human biological shapes like the vascular system or neuronal dendrites are easily modeled by fractals.

The word "fractal" was coined by Benoit Mandelbrot in the 1970s from the Latin word "fractus" meaning "broken into irregular fragments." The mathematical concepts underlying what Mandelbrot called fractals were much older, dating from the end of the 19th and early 20th centuries. Fractals possess the interesting properties of scaling and self-similarity. A given fractal produces the same pattern over and over again at different scales; like chaotic equations, one cannot predict exactly when the pattern will recur. Not all chaotic equations are fractals but the stable patterns produced by iterations of chaotic equations are all fractals. This means that the stable patterns of activity governing the heart or the brain will all be described by fractals. Researchers therefore can search for stable patterns of heart function or neuronal firing, identify them as fractals, and then seek to find the formulae of chaos theory that would generate those fractals.

Symmetry. Interestingly, mathematical chaos can produce symmetry. Many of the stable points of chaos formulae produce symmetrical fractals. We find a movement from asymmetry to symmetry that is mirrored in the way the human body interacts with the mind. The human brain is largely symmetrical: structures in the left hemisphere are matched in the right hemisphere. But investigation of cognitive functions demonstrates asymmetry in the regions of the brain where these functions originate. This asymmetry is more than just a left-hand/right-hand thing. Objects in the left visual field do activate the right occipital cortex and those in the right activate the left occipital cortex, but when men view words, only a region in the left hemisphere is activated, whereas when women view words, both left and right hemispheres are activated. Understanding how functional asymmetries, especially those involved in the operation of the mind, arise from a more or less symmetrical body is crucial to understanding the chaotic mathematics of humans.

Chaos and the Heart

One of the earliest and most startling discoveries arising from the application of mathematical chaos theory to medicine was the finding that ventricular fibrillation (and related tachyarrhythmias causing sudden death) were the result of periodic process, not cardiac chaos. Cardiologists were surprised to find that the normal heartbeat is not strictly regular. In resting subjects, the heartbeat fluctuates in a highly erratic fashion, with spikes superimposed on oscillations caused by respiration, baroreceptor control, thermoregulation, and the renin-angiotensin system. The chaotic dynamics of the normal heartbeat probably reflect the need for an adaptive response of the heart to a changing environment. Intuitively, this seems quite plausible since the body must provide constantly changing responses to a changing physical environment in which the person lives. Figure 1, below, shows the time series of the heartbeat of a healthy person plotted on three different time scales. These different time scales all indicate the irregularity of a normal hearbeat.

Why did we formerly believe that the normal, healthy heartbeat had a regular sinus rhythm? Probably because with the time scale displayed by an electrocar-

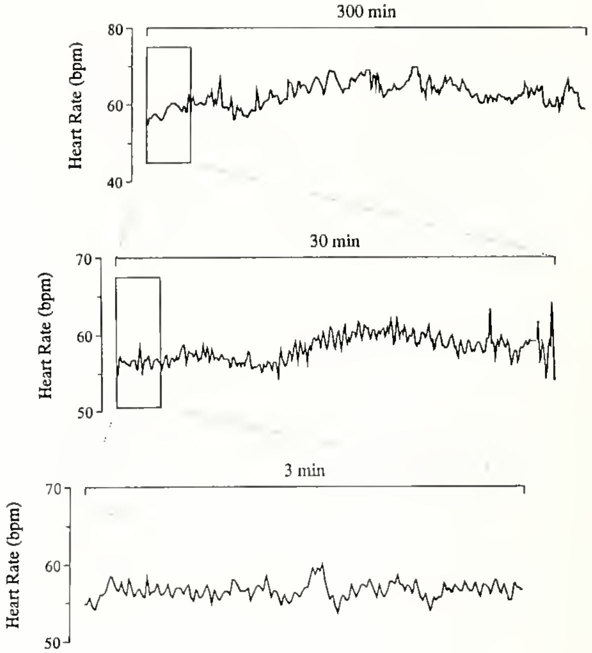

Fig 1: The normal heartbeat fluctuates in an apparently irregular fashion. These fluctuations, when examined at different temporal resolutions, show a similar type of "rough" surface. Reprinted with permission from: Iannaccone PM, Khokha M (eds). Fractal Geometry in Biological Systems. Boca Raton, FL: CRC Press, 1996.

diogram (ECG), the picture looked regular with spikes at periodic intervals. If one examines the interbeat intervals however, the time series found here for normal subjects fluctuates in a complex, seemingly erratic manner. One also can observe the irregularity of the heartbeat in the ECG if the time scale over which the beats are measured is changed. But looking at the interbeat interval provides the most vivid demonstration of the chaotic nature of the normal heartbeat. In comparing the interbeat interval time series of a healthy person with that of someone with heart disease, the healthy heartbeat time series shows much more complexity.

In chaotic systems, stable clusters often appear, to which iterations return again and again. These clusters are called strange attractors ("strange" because they were unexpected). Interestingly, the strange attractor points of chaotic systems are fractals, and such fractals play a major role in understanding the time series of heartbeats. In some cases, these fractals produce symmetry that is the very exemplification of arrhythmic heart disease: regular patterns in which the heart literally runs away. Fractals can be used to describe the anatomy as well as the physiology of the heart because heart muscle is organized as a fractal hierarchy of bundles composed of fibers composed of fibrils composed of myofilaments (actin and myosin). Nevertheless, it is the analysis of temporal chaos (including fractals), rather than the fractal analysis of structure, that has led to major changes in cardiology. Without the use of mathematical chaos theory to analyze the heartbeat, we still might view normal heart rhythms as regular, and abnormal as chaotic instead of the other way round.

Chaos and the Brain

The brain consists of approximately 10^{12} neurons with approximately 10^{22} connections. The operations of the brain can be simulated by mathematical chaos theory. Neural processes are nonlinear as is shown in the analysis of the activation of individual neurons that fire when the ionic electrical potential across a membrane achieves a certain threshold. On the macroscopic level, investigations of the olfactory bulb of the rabbit demonstrate that brain activations involving scent are chaotic. Finally, studies of the time series of electroencephalograms (EEGs), like the studies of heartbeats, show brain rhythms to be chaotic, with fractal attractors as the stable points. An understanding of normal temporal and sequential neuronal processes may allow us to understand how these processes fail in Alzheimer's or Parkinson's diseases, etc. The very complexity of the brain lends itself to analysis by chaos theory.

At Duke University Medical Center we are using positron emission tomograms (PET) of the brain to study how it is activated by the visual perception of geometrical shapes. We hope to model the visual cognition process using chaos theory, and we are looking especially for fractals. Our studies have located the significant brain regions involved in the recognition of circles and squares, and we find different regions of the brain that show increased blood flow (activation) for squares or for circles. An unexpected result has been the discovery that men and women employ different regions of the brain to discern the circle and different regions to discern the square. We are now investigating different and more complicated shapes, but our initial mathematical analysis of the spatial fractal nature of this cognitive activation has been successful.

Detection of chaos in a system typically means analyzing information from the system to determine its degree of complexity. The best description of this lies in something called the fractal dimension (remember, fractals occupy only portions, or fractions, of a dimension). Several mathematical methods exist for determining the fractal dimension of sets of data. The most common of these is the technique of "box-counting." Consider a two-dimensional plot of the coastline of an island. Apply a grid to this plot and count the number of grid boxes that contain a portion of coastline. Next, decrease the grid size and again count the number of grid boxes that contain a portion of coastline. Then plot these data on a logarithmic plot, where the ordinate is the inverse of the number of boxes in the grid and the abscissa is the number of boxes containing a piece of the coast. The two on this graph form a straight line, the slope of which represents the fractal dimension of the coastline of the island. This same technique can be applied to time- or spatial-variant data to yield its dimensionality. Modified versions of box-counting can be used to obtain several measures of fractal dimension: the capacity dimension, the information dimension, and the correlation dimension.

The three-dimensional images shown in Figure 2, next page, represent composite PET scans of brain activation as individual men and women push a button when the figure of a circle or a square appears. In preparing these figures, we submitted the geometrical data of the regions activated to a box-counting algorithm which produced the slightly jagged shapes displayed. The fractal dimensions of these activated regions of interest differ between men and women and between circle and square. The correlation fractal dimension for men recognizing a circle is 1.492 and for men recognizing a square, 1.802. For women, the correlation fractal dimension for the circle is 1.597, for the square, 1.893. The fractal dimensions for both men and women recognizing circles and squares are approximately the same. We do not yet understand why this is so. This question becomes even more intriguing when one recalls that men and women exhibit different regions indicating activation in the recognition of the different figures. The similarity of spatial fractal dimensions for both genders recognizing the same geometrical figures with different regions of the brain may just be a coincidence. Perhaps future research to look at the chaotic sequence of brain areas activated coupled with this spatial information may yield an explanation. That we cannot now present an explanation may not seem surprising since to our knowledge, our studies are the first to generate actual fractal analyses of brain processes.

But what do the images in Figure 2 "mean"? Merely that we have been successful in discovering the spatial fractalness of

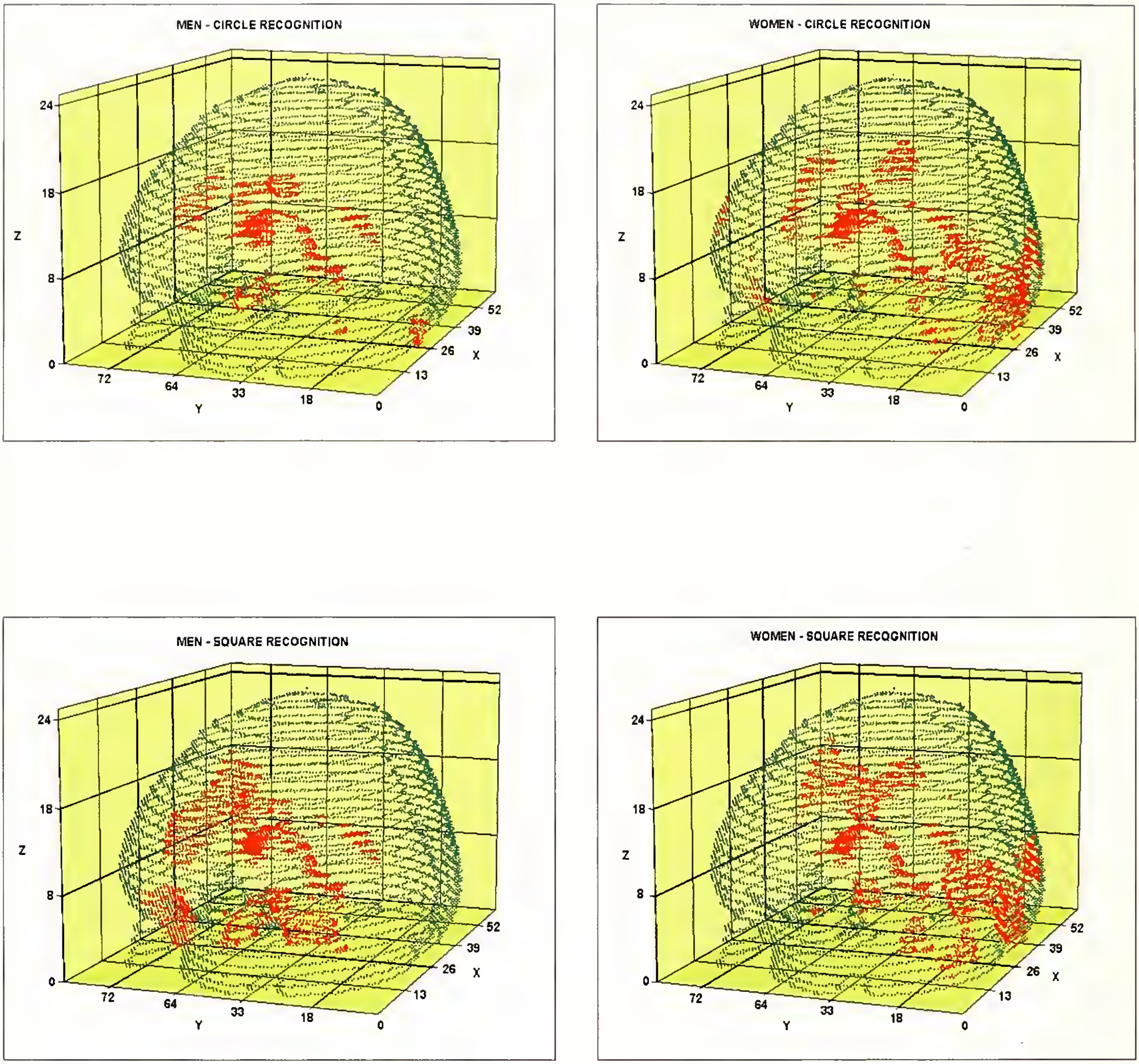

Fig 2: Four composite PET scans of men and women recognizing circles and squares to which a box-counting algorithm to determine fractal dimension has been applied. The program for this algorithm was written by John Sarraille and Peter DiFalco using ideas from "A Fast Algorithm to Determine Fractal Dimension by Box Counting" (Liebovitch, Toth. Physics Letters 1989;141:386-90). Each image in this figure shows the spatial fractal for each individual PET scan.

brain regions during cognitive activation. To understand the full chaotic process of neuronal processing, we will also have to discover the temporal series of events taking place in the brain. By comparing the dimensions of data from various stimulations or by determining changes in dimension as a function of time, we hope to characterize various brain functions in terms of their nonlinear dynamic characteristics.

The temporal resolution of PET is poor. This means that analysis of a time series of neuronal processes within the brain awaits an improved experimental apparatus. To achieve this, we hope to combine PET with EEG in a simultaneous experiment. The better spatial resolution of the PET will be combined with the better temporal resolution of the EEG. Although still preliminary, our studies suggest that the application of mathematical chaos theory to neuronal processes will generate results applicable not only to understanding the operation of the normal brain, but also to understanding the failures in operation of the diseased brain. The latter may assist in both diagnosis and therapy.

Conclusions

Mathematical chaos theory reveals the complexity of the human body and its interaction with the human mind. The use of mathematical analysis may enable patients to contribute to their own healing through changes in behavior and mental attitude, as well as enable better choices of traditional therapies such as drugs. Begun in the late 1980s, the introduction of mathematics into clinical medicine has sufficient momentum to generate interesting and useful results for the practice of everyday medicine. We can expect that future results will be unexpected, like the chaotic nature of heart rhythms, and just as exciting. ❑

Acknowledgments:
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Suggested Reading

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Prepare papers according to the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (N Engl J Med 1991;324:424-8) with the following exceptions: 1) no abstract is needed; 2) no running title is needed; and 3) report measurements in metric units; use of the International System of Units (SI) is optional.

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Submit tables, charts, and graphs as hard copy *and* include copies on disk, in their original format *and translated as TIFF, PICT, or EPS documents.* Type all figure legends separately. Type and double-space all tables, one to a single sheet of paper. Tables must have titles and consecutive Arabic numbers.

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The Spiritual Platform

Spirituality and Psychotherapy in Addiction Medicine

Jeffrey M. Georgi, MDiv, CSAC, CGP

Before we can actually begin discussing clinical spirituality, it is important to place its relationship to the treatment of addictions within a theoretical frame. Like other diseases that are responsible for much of human morbidity and mortality (heart disease, cancer, diabetes, infection, and trauma), addiction is best understood when its biological, psychological, social, and spiritual aspects are considered together. Coronary artery disease provides a well-documented example of this way of understanding diseases. We know that some individuals are born with genetic traits that make them more vulnerable to coronary disease. By the luck of the genetic draw, some individuals process lipids inefficiently, produce higher levels of low-density lipoprotein and lower levels of high-density lipoprotein cholesterol. When these (and a variety of other) biological vulnerabilities combine with a high-stress lifestyle, a hostile, angry personality structure, a diet heavy in saturated animal fats, limited exercise, and a diminished ability to find meaning in one's life and relationships, we have a heart attack in the making.[1,2] Addiction follows this model. It manifests itself when the biological vulnerabilities of an individual combine with a particular set of psychological liabilities, social pressures, the availability of drugs and alcohol, and an individualized sense of spiritual emptiness.[3]

The Disease of Addiction

From a biological perspective, a growing body of data suggests drug addicts and alcoholics differ biologically from the non-addicted. Differences in both their brain chemistry and their metabolic processing of drugs make addicts particularly sensitive to the re-enforcing aspects of drugs of addiction. Even so, and despite the growing evidence that these biological vulnerabilities have genetic ties, it would be erroneous to conclude that addiction is solely biologically determined.[4] Addictive disease has a significant psychological component as well.

The work of Kohut,[5] Levin,[6] and Flores,[7] shows that the psychological "woundings" that addicts experience in life give energy to the biological vulnerabilities with which they are born. Many individuals who develop addictions as adults come from families or environments characterized by profound failure of parenting or other deficiencies of early nurturance. For a variety of reasons, these patients do not get "good enough" parenting to develop internalized self-confidence, capacities to self-soothe, and an integrated sense of their own wholeness. The psychological liabilities that stem from early narcissistic injuries and the traumatic absence of nurturing make the need for self-medication (and its eventual escalation into addiction) understandable. Heinz Kohut posits that drugs of addiction serve to restore addicts' sense of wholeness and potency.[5] From the addicts' point of view, what we call a drug of addiction is a primary coping mechanism that helps them negotiate their way through the world. They fear that without the drug they will literally "fall apart," will cease to function if not cease to exist altogether. Well beyond any "physical" dependency (although this spurs the addictive process), addicts feel dependent on their drugs for emotional survival. Simply put, drugs [psychologically] let addicts get from one day to the next.

Giving further impetus to these biological and psychological variables is the social context in which addiction occurs. Our culture perceives emotional and physical pain at any level as unacceptable. Madison Avenue spends billions of dollars each year, convincing us that no amount of discomfort is to be tolerated—and that there is a pill or potion to treat every conceivable distress we may encounter. In addition to a pain-intolerant culture, our generalized acceptance of pharmacological escapism in the face of the sociological pressures undermines relationships and our sense of interconnection. Finally, a number of our cultural rituals center around, or at least involve, drug or alcohol use. Many of our young people see drug use, including nicotine, as a rite of passage, a socially accepted norm or an act of defiance against a culture they feel ignores their needs.

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The spiritual factors associated with addictive disease find their expression within the context of our culture. The testimony of millions of alcoholics whose recovery is grounded in Alcoholics Anonymous (AA) supports the importance of spiritual emptiness in the development of alcoholism.[8] AA actually suggests that alcoholism is a spiritual disease. Studies by Mathew at the Duke Alcoholism and Addictions Program indicate that spiritual emptiness leads to the expression of addictive disease and that the use of drugs and alcohol may be an attempt by the addict to artificially fill a spiritual void and overcome a sense of emptiness.[9] The work of Joan Borysenko supports the value of a spiritual focus in the treatment of addictive disease.[2]

The Spiritual Platform

It is helpful to view spirituality not as an attribute that human beings possess, but rather as an *activity* they do. Viewed in this way, spirituality becomes an *existential expression*.[9] Admittedly, this is a significant departure from a mystical view of spirituality, but it has a utilitarian advantage. It means that spiritually sensitive psychotherapeutic interventions such as directed actions or increased awareness will allow us to authentically access our spirituality. It is helpful to visualize our facility for spirituality as a platform supported by four activities unique to humans: 1) a capacity to make conscious *choices*; 2) an ability to take growth-producing *risks*; 3) a facility to develop healthy *relationships*; and 4) a capacity to experience *wonder* and *awe*.[2] These "pillars" of spirituality are undermined by mental and physical illness in general, but they are specifically weakened by addictive disease. Just as patients suffering from major depression do not awake each morning consciously "choosing" to be depressed, so neither do addicts choose their cravings. In both situations, the symptoms (depression or craving) are expressions of the intricately woven tapestry of a biological, psychological, sociological, and spiritual life. This is not to suggest that patients struggling with depression or addiction completely lose their capacities to make choices; rather it is to recognize that their capacity for choice is diminished.

Addictive disease undermines the pillars of risk, relationship, and wonder. When a drug becomes the patient's dominant coping mechanism, its tenacious hold on his or her life interferes with the ability to become vulnerable and thus to take growth-producing risks. The capacity to form healthy relationships suffers. Relationships are expressed through the interdependency of two individuals; addiction blurs the boundaries between individuals and contaminates the sacred space between them in which the relationship takes place. Not only is the capacity for relationship threatened by boundary violation, but there is little "room" for other people; the drug of addiction becomes the primary "love" object, pushing all others out.

Addiction assaults our capacity for wonder and awe. The predictable monotony of the internal response to a drug cuts off the capacity to be surprised or encounter wonder. Patients' lives, which may appear chaotic and unpredictable to the outsider, are as internally predictable as those of prisoners in chemical cages. They know what to expect from the drug that controls them. Even if it no longer meets its original promise, the drug's "magic" insulates its users from the wonder of the possible. Freedom from pain is always one drink or one pill away. The seeds of shame sowed in the childhood are gifts from the past that give birth to obligation—obligation to continue drug use or to "reexperience" the shame associated with that use. The outcome is always the same: more shame and the familiar certainty of addictive disease.

In discussing spirituality, it is important that we not limit our focus exclusively to the pillars that support it. Instead, we must recognize that spirituality is defined not by the content of our lives, but by the experience of life's process. Spirituality, clinically defined, is a verb not a noun so that choosing is more important than the choice. Risking and the expansion associated with risk-taking are more growth-producing than the outcomes of risks taken. The energy and vitality of relating within the "sacred space" between two individuals is more connecting and more potent than the end result of relationship itself. Mindful wondering in the here-and-now is more expansive than the object of awe. Spirituality thus defined means awareness and participation in the process of choosing, risking, relating, and wondering.

As a process, spirituality takes place in the immediate moment. The immediate has no definition, no beginning, no end. It is not tangible. It has no content and no form. Our capacity to be spiritual can, in a sense, be measured by our ability to participate in and surrender to the immediate moment with all of its uncertainty. Such "surrender" often leads to ambiguity and anxiety which many of us find frightening. From a psychological point of view, we lose our capacity to be spiritual whenever the pain of our inner and outer worlds drowns out our capacity to be still, denying us the experience of immediacy and process. Addiction reduces our capacity to experience spirituality by eroding its supportive pillars and interfering with our ability to engage the immediate moment. Drugs of addiction literally take us out of the present and cloud the here-and-now with a pharmacological blindfold separating us from immediacy.

Spirituality, as I have defined it, is fundamentally a function of the right cerebral hemisphere. I do not mean to suggest that spirituality can be reduced to a collection of neurons found in the right hemisphere, but only to point out that the right hemisphere, sensitive to issues of flux, flow, process, and intuition, may be the avenue to spiritual experience and, perhaps, an antenna to the transcendent.* We do know that over time addicted patients become more and more concrete in their thinking, less tolerant of the ambiguities of life, more driven by outcomes, and hence, more left hemisphere dominant. Furthermore, there are indications that many drugs of abuse may have their primary site of action in the right hemisphere.[10] This is consistent with the idea that addiction represents a pharmacological effort to overcome a subjective sense of spiritual emptiness.

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*A discussion regarding the existence of the transcendent falls more into the realm of theology and is beyond the scope of this paper.

The clinical task of recovery takes the form of a gradual movement away from a left hemisphere dominated life to a more process-sensitive right hemispheric one. However, we must be clear that the clinical goal is not an either/or effort. In order to "be in the world," one must pay attention to certain material aspects of life. The goal is not to "purge" the patient of all vestiges of materialism but rather to seek a balance between spirituality and materialism, which will allow the patient to fully realize the benefits of both.

Spiritual Psychotherapy

"Spiritual psychotherapy" recognizes the importance of the psychological variables supporting addictive disease and the intrapsychic pain experienced by patients. Awareness of that pain and an appreciation of self-woundedness is an important aspect of addicted patients' spiritual growth. But unlike traditional, insight-oriented therapy where the primary focus is to reduce psychic pain through introspection and understanding, spiritually focused therapy helps patients embrace the pain as an expression of their own mystery and vitality. Using, but not limited to, psychological interventions, patients are helped to find their true grandiosity and embrace their own wonder. In this process they are encouraged to become aware of their own choosing, risking, relating, and wondering. Within the therapy relationship itself, and particularly in group therapy, patients become more capable of mindful participation in the here-and-now, and move to a more spiritual focus. The therapist is less of a guru imparting insight or showing the way and more of a "cheerleader" sharing genuine enthusiasm when moments of immediacy are experienced in therapy sessions. At the same time, the therapist must consistently address addicts' vulnerability of self, difficulties with affect regulation, struggles with self-care, and needs for gratification and support.[11] Addicted patients are exquisitely sensitive to abandonment and environmental change. Therapists must proceed with caution and attention to detail because patients may experience any human fallibility of the therapist as profoundly wounding.

During therapy it is important not to deny the inherent dialectic tension between materialism and spirituality mentioned above. As AA and Narcotics Anonymous have demonstrated, there is a materialistic aspect to recovery. Patients in early recovery often need to be told what to do simply to get through their day without using their drug of addiction. They have to be reintegrated into the world and learn to "accept life on life's terms." At the same time, they must be encouraged to slowly and carefully become mindful of their process capacities, not only within the therapy relationship but in life in general. Over time, as the spiritual journey becomes more comfortable, the therapist encourages activities that support a right hemispheric world view. Some patients may find help in traditional religion; others in music, on a mountain top, in a meadow, or in the simple pleasures of experiencing relationship as it occurs. Some basic "homework" assignments, similar to those associated with "mindful" living, can help patients conceptualize spirituality and then experience it. Patients who characteristically hurry through meals in order to get on to "more important" activities can be encouraged to be "mindful" during at least one meal a week, eating slowly and paying attention to each small bite. The texture, temperature, and flavor of each bite become the intense focus for the moment. In so doing, patients become fully engaged in the experience of eating as they are eating. They are alive and aware that they are alive in the moment. Even something as mundane as a morning shower can become a source of spirituality if patients allow themselves to attend to the sensual experience rather than just "cleaning up" to get ready for the day. The opportunity to experience one's process in the world is virtually limitless. It provides the therapist with many opportunities to engage patients' spiritual growth.

> "...(patients) must be encouraged to become mindful of their process capacities, not only within the therapy relationship but in life in general. ...as the spiritual journey becomes more comfortable, the therapist encourages activities that support a right hemispheric world view."

It is important to remember that the narcissistic wounds within our psyche are not a "pool of pollution" to be drained, filtered, and cleansed through introspection and insight. Rather the psychic pain that gives energy to addictive disease is like a storm on the ocean of the unconscious. Even in the face of the storm the therapist can support patients' efforts to move past the internal pain to the stillness and greater responsiveness of right hemispheric sensitivity. We can help patients to find the safe haven of immediacy and eventual recovery. Of course, neither therapist nor patient must ever mistake the perilous sea for a placid pond. Such mistakes can be life-threatening. But through patience, awareness, and the shared wisdom of community, patients, like good sailors, learn not to shirk the voyage. Instead, with the help of the therapist and therapy group, they learn to navigate the ocean, learn when to find safe harbor in the face of the approaching storm, learn to accept the storm itself as an integral part of the ocean's wonder, life, and mystery. For it is through acceptance and integration that patients expand their spirituality and solidify their recovery. ❑

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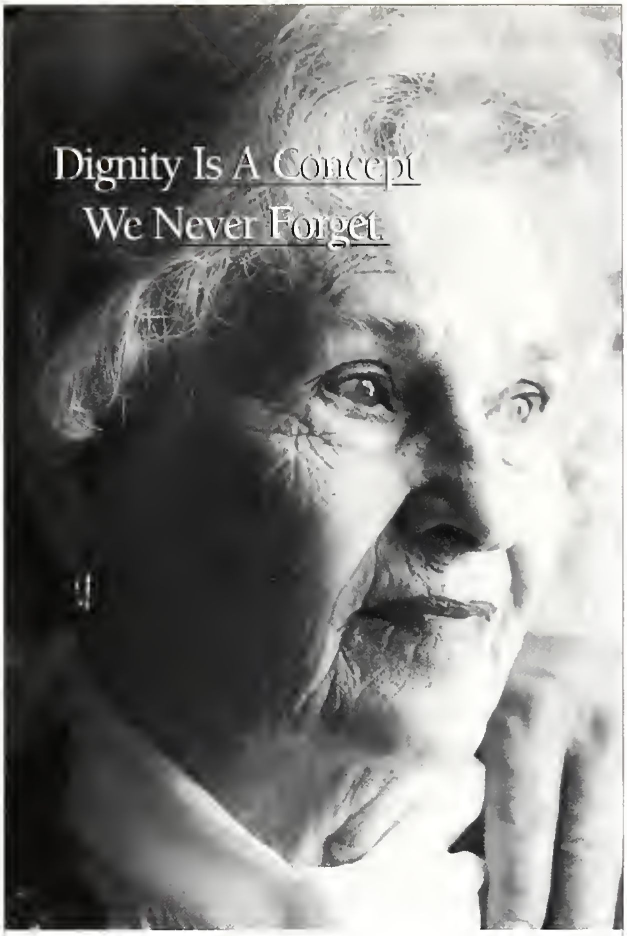

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The Mind, the Body, Health, and Disease

What Do We Know, What Should We Do?

Redford B. Williams, MD

Today we know considerably more about the impact of the mind on the health and diseases of the body than we did even 25 years ago. We have learned that interventions targeting psychosocial risk factors lead to improved prognoses in patients with a wide range of medical illnesses. In this paper I shall provide a brief overview of the evidence supporting these points—the "*What do we know?*" of my title. We now know enough, in my opinion, to lay out an agenda for incorporating behavioral and psychosocial interventions into our treatment of patients with a wide range of chronic or life-threatening medical illnesses. In the second part of this paper I will outline my vision for applying our new knowledge about mind-body effects on health and disease—the "*What should we do?*" of the title.

What Do We Know? Psychosocial Risk Factors for Disease and Interventions That Target Them

A recent, comprehensive review[1] of the scientific evidence documenting the impact of psychosocial factors on the onset and course of major medical disorders identifies five factors that contribute to the development and prognosis of health problems. Several studies of healthy populations have documented that persons with a hostile personality type (characterized by high levels of cynical mistrust, anger, and aggression) are at high risk of developing coronary heart disease, as well as high risk of developing cancer or dying from any cause. Hostility also appears to be associated with accelerated development of atherosclerosis, and restenosis of atherosclerotic vessels following angioplasty.[2]

An equally extensive literature[3] documents the health-damaging effects of social isolation (low levels of social support) in both healthy and diseased populations. In one study of more than 1350 coronary patients,[4] those who were socially very isolated had a five-year mortality rate of 50%, compared to only 17% in those less isolated.

Recent research also documents the deleterious impact of depression—both subclinical dysthymia and major depression—on myocardial infarction rates and all-cause mortality in healthy populations. In one study[5] of myocardial infarction patients, a group with major depression had a mortality rate of 16% over six months, compared to only 3% in nondepressed patients.

Workers with high levels of "job strain" (demands to produce output but little feeling of control over how the demands are met) suffer from a wide range of health problems. In one recent study[6] workers reporting high job strain were more likely to have high levels of depression, social isolation, and hostility, as well. The clustering of psychosocial risk factors in individuals also occurs in certain groups. Those in lower socioeconomic groups (who are at higher risk for a broad spectrum of health problems, including premature mortality[7]) have been shown to have higher levels of the psychosocial risk factors that increase risk of health problems. Of particular importance, the presence of more than one psychosocial risk factor, especially in persons of lower socioeconomic status, accentuates the impact on health.[8]

In addition to the impact of psychosocial risk factors on morbidity and mortality in healthy and diseased populations, numerous studies have documented the impact of psychosocial factors on utilization and costs of medical services. For example, a study[9] at Kaiser Permanente found that more than 60% of all medical visits were made by the "worried well" who had no diagnosable medical condition.

We still lack a final and complete understanding of the pathways whereby psychosocial risk factors contribute to the deterioration of health and the development of various major

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medical disorders. However, a recent review[10] of a sizeable body of research points out that both behavioral and biological mechanisms are plausible mediators. Persons with high levels of hostility are more likely to engage in risky health behaviors such as tobacco smoking, alcohol consumption, and poor nutrition. They also have increased sympathetic and decreased parasympathetic nervous system activity, and increased activation of the hypothalamic-pituitary-adrenocortical axis. The clustering of these potentially pathogenic behavioral and biological characteristics strengthens the case that psychosocial factors contribute to poor health.

Additional support for the health-damaging potential of psychosocial risk factors comes from encouraging evidence[1] that targeted interventions can ameliorate the adverse health impact. This research thus satisfies Koch's third postulate: that removal of a causal agent will result in improvement of the disease it is thought to cause. In both heart disease and cancer, randomized clinical trials of structured and focused, group-based interventions that enhance patients' ability to cope with stress and reduce psychosocial risk factors show that recurrence rates can be cut by 50% and survival prolonged by as long as 100% over usual care. In addition to improving prognosis, Cummings and coworkers[11] have shown that such interventions reduce medical costs of patients with chronic medical disorders compared to patients receiving usual medical care, or traditional one-on-one psychotherapy.

Let me summarize where I think we stand: Epidemiological research has identified several psychosocial risk factors—hostility, depression, social isolation, high strain jobs, and lower socioeconomic status—that increase the risk of developing a wide range of health problems. These factors do not occur in isolation, but tend to be clustered in certain individuals and groups, especially lower socioeconomic groups, where their health-damaging effects are magnified. We have identified both behavioral and biological accompaniments of these psychosocial risk factors that are plausible mediators of their effects on health. Finally, encouraging recent evidence from carefully conducted, randomized clinical trials shows that teaching persons skills that enable them to cope more effectively with stress and reduce their psychosocial risk factors improves the prognosis in patients with heart disease and cancer, and reduces utilization and costs of medical services in patients with a wide range of chronic medical conditions. Based on these conclusions, I turn to my second question.

What Should We Do?

Margaret Chesney and I concluded in a recent editorial[12] that the evidence documenting the health-damaging effects of psychosocial risk factors, the likely biobehavioral mechanisms, and the likely benefits of behavioral interventions targeting those risk factors makes a strong case for the need for a major research program to design, implement, and evaluate behavioral interventions in both secondary and primary prevention of coronary heart disease and other major medical disorders. This work has already begun. The National Heart, Lung and Blood Institute's multicenter ENRICHD (ENhancing Recovery In Coronary Heart Disease) trial will randomize 3000 myocardial infarction survivors at high risk because of depression and/or social isolation to receive either usual care or a behavioral intervention. The ultimate goal is to show that an intervention based on principles of cognitive behavior therapy and using both individual and group treatment modalities will reduce the high mortality found in depressed or social isolated patients with coronary heart disease.

The ENRICHD coordinating center[13] is located at the University of North Carolina at Chapel Hill, and the clinical centers at Duke, Stanford, Miami, Chicago, Boston/New Haven, University of Alabama-Birmingham, the University of Washington, and Washington University. This ambitious clinical trial has the potential to alter treatment of myocardial infarction patients as profoundly as the Beta-blocker Heart Attack Trial (BHAT) did 20 years ago. Since BHAT, all patients with uncomplicated myocardial infarction are routinely treated with beta-blocking drugs. After ENRICHD, we may see that all depressed or socially isolated post-infarction patients will be routinely referred for behavioral treatment.

But we need not wait, in my view, for the results of research like ENRICHD—or a similar, smaller scale trial of support-based group intervention for cancer patients currently being conducted by Stanford psychiatrist David Spiegel—to prescribe behavioral interventions already known to be effective[9] in reducing pain, suffering, and costs in a wide variety of medical and surgical conditions. Further impetus to proceed comes from the work of Cummings and his coworkers in the Hawaii Medicaid Study.[11] They provided training in coping skills to the top 15% of users of Medicaid health services (these patients accounted for 80% of costs). Trained patients reduced their need for medical-surgical services by 15%-20% in the following year, but patients who received either no psychological treatment or traditional one-on-one psychotherapy showed 17%-27% increases in medical-surgical services utilization.

Can we identify the key elements of those intervention programs[9,11] that have proven successful? First of all, these interventions are often offered in group settings. Groups are more efficient than one-on-one approaches, they enable patients to learn from each other, and they allow members to provide each other with powerful social support. Second, these interventions often incorporate principles of cognitive behavior therapy and behavior therapy. They focus on the problems with which patients must deal in the here-and-now. They provide "hands-on" practice (in-session exercises) in the skills of coping with stressful situations and the negative emotions those situations engender, and they include homework assignments. These interventions are often limited to a fixed number of sessions, but some extend over of a year or more.

A good example of the approach I am advocating is the six-session "Lifeskills Workshop" that Virginia Williams and I have developed and described in our book, *Lifeskills*.[1] The workshop is designed for use with a wide range of groups: patients suffering from chronic medical conditions; healthy persons wishing to stay well by learning how to cope with stress; persons in high-stress situations like high-demand/low-control jobs, or faced with corporate downsizing; persons with psychosocial risk factors (hostility, depression, social isolation, lower socioeconomic status) that put them at risk for health problems; and high users of medical services.

The skills we teach in the workshop fall into two groups (Table 1, at right). Each skill is taught according to a standard format. The group leader first explains the skill and the rationale for its use. Next, the leader models the use of the skill, using examples from both his or her own life and that of the participants. Next follows an in-session exercise allowing participants to practice the skill, often in a role-play format. Homework assignments ask participants to practice the skill in their own, "real world" life situations. The final step is a report at the next session on how the homework went.

The Lifeskills Workshop is appropriate for both wellness and treatment settings (the content may be tailored to the kinds of medical problems encountered). As time goes on, we expect that it and similar interventions will be incorporated into regular medical practice as a new model for both primary and secondary prevention. Critical to this transition will be the ability of behavioral scientists and practitioners to package these interventions into forms that will allow them to be delivered in a standardized way and achieve comparable outcomes in different settings.

I believe that we are at a stage in the development of behavioral interventions similar to where physicians were a few centuries ago in using foxglove to treat dropsy. Each apprentice physician learned how to grind up foxglove leaves, dissolve them in some solvent, and administer the potion to the patient. Often, because foxglove contains several digitalis glycosides, the treatment benefited the patient. Often, however, it did not, either because the preparation was too weak (providing no help) or too strong (inducing toxicity). It took a nascent pharmaceutical industry to package the foxglove—first as "digitalis leaf" tablets and later as purified digoxin, digitoxin, etc.—into products of standardized potency so that all patients could achieve maximum benefit.

If we can make the same progress with behavioral interventions, I believe we can prevent many diseases, relieve suffering, and speed recovery in many more, enhance the well-being of those we care for, and save a great deal of money in the process. ❑

Table 1. Lifeskills[1]

I. Learn to understand yourself and others by:
  a. Identifying negative thoughts and feelings
  b. Evaluating and managing negative thoughts and feelings
  c. Communicating effectively using speaking and listening skills
  d. Empathizing to understand others' behavior

II. Learn to act effectively by:
  a. Using problem-solving skills in situations that bother you
  b. Practicing assertion, when another person's behavior is bothering you
  c. Practicing acceptance, when doing so will cause no harm
  d. Increasing the positives in your life and relationships

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Hypnosis

Fact or Fiction for Treating Pain and Related Disorders?

Patrick Logue, PhD, and Christopher L. Edwards, PhD

Hypnosis is one important way in which we can use the mind to assist the body. Focusing an individual's attention onto a single powerful stimulus and the use of rhythmic or repetitive visual and auditory cues under conditions of emotional commitment have been part of religious and spiritual ceremonies for thousands of years. We have also known for centuries that the heightened but narrowly focused attention evoked in times of crisis, stress, and war induces a substantially decreased awareness of internal and external environmental cues. Fortunately, these reactions can be duplicated and used in the treatment of clinically persistent pain.[1]

In some ways the resemblance of hypnosis to spiritual or religious phenomena has not always resulted in a positive comparison for either. Many medical professionals suspect that hypnosis is quasi-religious, spiritual, or "New Age," a stance that pleases neither the pragmatically scientific (who view hypnosis as lacking empirical validity) nor the devoutly religious (who view hypnosis as a crass attempt to secularize a spiritual gift). The debate about whether hypnosis is an art or a science was not helped either by the historical quasi-science that surrounded "mesmerism" and Animal Magnetism. In the 19th century, the pragmatically useful aspects of hypnosis (including pain control) were explored and used with increasing frequency. Freud, the founder and advocate of psychoanalysis, was intrigued by and embraced the use of hypnosis in psychiatry, but later rejected it as providing a superficial misunderstanding of the underlying causes of psychopathology. Only in the current century has medicine broadly recognized the usefulness and generally innocuous nature of hypnosis in clinical practice.

The preceding paragraphs are typical of those found in beginning texts and articles exploring therapeutic hypnosis in medicine, psychology, and psychiatry. But on a practical level, why should anyone be interested in or attempt to learn a procedure that seems so far afield from real science and mainstream medicine and psychology? There is no universally recognized or scientifically grounded definition of hypnosis that will easily discriminate it from a relaxed but aware state, although it certainly can be discriminated subjectively, objectively, and scientifically from sleep. Why should anyone want to complicate an already overly complex clinical practice by employing a procedure that must be explained and justified to a skeptical "outside world"? The short answer is because hypnosis works—not with every patient, not always in a spectacular fashion, and certainly not with every condition—but it works. Used adjunctively, in a carefully delineated way to control chronic pain, it is a benign procedure that can help a majority of patients. It can be used alone or in conjunction with a number of other techniques that are similar but not identical. Patients can learn to apply hypnosis themselves and thereby gain some measure of self-efficacy in a world of increasingly bewildering medical technology. In a small number of patients, impossible to predict in advance, hypnosis is a very powerful therapeutic tool that brings a level of control over pain that patients may not have experienced before. In sum, it a technique that helps many patients significantly and a few profoundly. In the current accountant-mediated environment, it is worth noting that hypnosis is a procedure that any practitioner can learn, that only takes 20 minutes to execute, a few days to evaluate, and a lifetime to perfect.

Hypnosis and Pain Management

We know that a patient's cognitive and emotional state can influence the disposition of his or her physiological system, and that changes in emotional and cognitive states bring about substantial changes in the level of general functionality. This intimate mind/body relationship can be exploited for the treatment of pain disorders. Hypnotherapists, psychologists, psychiatrists, psychiatric nurses, and medical doctors have in hypnosis a tool that can, in many cases, attenuate pain by

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enhancing nervous system inhibitory processes. Used before or after the onset of pain, hypnosis allows a health professional to assist the patient by inducing a temporary state of relaxation, calm, and peace, even amid external confusion, disruption, and distress. Such temporary states of calm can effectively reduce a patient's subjective experience of pain—and the anxiety that accompanies pain—regardless of the etiology of the pain.

> "...hypnosis has been effectively used to treat pain related to fibromyalgia, deep tissue burns, cancer, and surgical operations."

Effective pain management employs a multifactorial array of treatment modalities, including attention to the patient's psychological, physiological, and social dispositions. The process starts with a thorough assessment of the patient's history, mood, thoughts, and beliefs about pain. Thereafter, techniques such as progressive muscle relaxation and hypnosis may be used to teach patients basic pain control and symptom management skills that may enhance their level of general functionality. Hypnosis has proven to be as efficacious as other behavioral pain control techniques, and its therapeutic value relies on more than just simple relaxation combined with placebo effect. When used alone or in conjunction with medications, hypnosis has been effectively used to treat pain related to fibromyalgia, deep tissue burns, cancer, and surgical operations.[2,3]

In many cases, behavioral sessions for pain control begin by providing the patient with information about pain management and the basic relaxation process. This is often followed by an explanation of a contextual framework by which to understand self-management of pain. The Gate Control Theory of Pain[4] may be used to help patients understand the basic pain pathway, and the relationship of pain to affect and cognitions. This is followed by relaxation skills training and techniques to generalize those skills into everyday life.

In a typical session of hypnosis for pain control, the patient's fears and misconceptions about pain management and hypnosis are addressed. During the critical initial contacts with the patient, the health professional is both a guide through the hypnotic procedure and a teacher of self-management skills. Hypnoanalgesia is best achieved when the health professional is able to tap into the mind's ability to influence the disposition of the body. This usually requires that the patient be both informed and cooperative, as well as a partner in the hypnotic endeavor. Typically the patient is given an opportunity to become comfortable with the information related to hypnosis, even if this requires postponing the hypnotic session or considering alternative treatments. Patients are often concerned about "losing control" during the hypnotic process, or whether they will engage in embarrassing or undesirable behaviors while hypnotized, or whether they will engage in behaviors against their will. These issues are addressed by emphasizing the patient's power, the fact that they are in full control of their actions during hypnosis, that they will remain aware of their environment to the degree that they choose, and that they will not engage in undesirable behaviors or disclose information they choose not to disclose. This information-based approach enhances rapport by demystifying the role of the health care professional and reassuring patients of their power to control their actions during the hypnotic process.

Once the patient is well informed and comfortable with the information, the hypnotist uses the patient's imagination to create an internal environment conducive to relaxation and increased pain control. This is achieved through hypnotic induction, the focusing of attention and deepening of relaxation, followed by hypnotic and posthypnotic suggestions, and session termination. The induction process often involves placing the patient in a physical setting that is conducive to postural relaxation with physical support such as a comfortable, well-cushioned chair. Postural relaxation is followed by muscle relaxation and mental imagery. The patient's eyes are closed and his or her attention is focused on a peaceful or soothing environment. Using verbal guidance, changes in inflection and intonation, changes in speech delivery rate and carefully chosen words, the patient is relaxed further into a state of extreme calm that enhances reception of direct and indirect suggestions from the hypnotist, including decreased pain perception.

> "...sensitivity to and integration of the patient's history is paramount to the effective application of hypnosis."

During the next stage of hypnotic induction, information about the phenomenology of the patient's pain history is used to generate hypnotic suggestions of analgesia. Most productive are suggestions or goal-directed visual images of situations involving the attenuation of pain, regardless of whether those suggestions can be realized. For example, a patient who disclose during the assessment phase that they have used the distraction of hot baths for subsequent pain control, can be asked to visualize an infusion of a warm, soothing liquid traveling through the body to ameliorate their pain. On the other hand, a patient who had a phobia related to needles or injections would require visual images that eliminate the concept of infusion. Most importantly, sensitivity to and integration of the patient's history is paramount to the effective application of hypnosis.

The hypoanalgesia that results from hypnosis has been attributed to inhibition of the peripheral nervous system, augmentation of frontal and limbic cortical responses, and changes in endogenous opioid levels, all factors that effect pain perception. However, patients who experience chronic or intense acute pain are less concerned about the neurohormonal and psychobiological mechanisms than they are about consistent and effective pain relief. They do care that the pain reduction achieved under hypnosis can be generalized into more alert mental states, and an increased ability to contend with pain-related difficulties. For many patients, hypnosis provides an increased capacity to handle difficult life situations independent of the amelioration of the pain.

The use of posthypnotic suggestion increases the probability of generalized effects that extend beyond the hypnotic session by invoking cues frequently encountered in the patient's environment. For example, it can be suggested that the patient remember the soothing, calming and pain-reducing encounter of the hypnotic session each time they experience particular environmental stimuli, such as sights, smells, and sounds they experienced during the session. Self-hypnosis may be just as productive and even preferable way to generalize the results of a hypnotic session. Self-hypnosis involves take-home audiotape or other media representations of the personalized session to teach patients regulatory skills. Self-hypnosis provides an additional tool to help some patients facilitate pain reduction and improve coping with pain.

It is important to distinguish the needs of patients with acute pain from those of patients who endure persistent or chronic pain. Patients with chronic pain are often depressed because of many failed attempts at pain control, and loss of general functionality. Hypnotic suggestions for these patients should attempt to address individual depressive symptoms including loss of desire to engage in pleasurable activities, general sadness, sleep and appetite disturbance, as well as pain control. Emphasizing the patient's self-control may improve the mood disorder. As part of the pain control process, these patients can be encouraged to fantasize about engaging in pleasurable activities or interacting with family and friends. In contrast, patients with acute pain often are dominated by the anxiety related to recent or pending events associated with their pain. Direct and indirect hypnotic suggestions for these patients may include fantasizing about anxiety-provoking events followed by favorable outcomes including pain reduction.

Advantages of Hypnosis

Most clinicians involved in pain management and most patients with persistent pain realize that today's increasingly complex pain management technology (transcutaneous electrical neural stimulator [TENS], pharmacology, etc.) tends to diminish the patient's level of understanding and the clinician's personal involvement with the patient. Both the technical expertise available for pain treatment and the pressure for speedy decision-making by patients and their doctors in an era of managed care increases the likelihood that patients will feel less and less able to influence their own medical care. This "learned helplessness" exacts a high price, further disengaging patients from the healing process.

However, hypnosis administered by trained health care professionals for the management of persistent pain has several potentially useful advantages. It can enhance the patient's self-efficacy to cope with pain, decrease pain perception, broaden the patient's pain coping repertoire, and permit effective self-utilization of the procedure by the patient after a relatively short learning period. Hypnosis also facilitates communication between patient and doctor, and increases the patient's involvement in their own care. Many patients appreciate and understand when they have entered a partnership with their doctor in an endeavor to increase their quality of life.

Typically, 75% to 80% of patients manifest a positive reaction to hypnosis. Hypnosis is a clinical tool that can be learned during a three-day workshop sponsored by an appropriate agency. However, the procedure must be practiced almost immediately after that first workshop to achieve clinical competence. The practitioner who does not get his or her feet wet quickly will never develop the skills needed for effective application of the procedure. If the clinician is fortunate, they may, in their early work encounter patients who experience a profoundly positive response to hypnosis; patients who have not responded positively to other techniques or pain control methods. Whereas the typical patient with effort can learn to decrease their pain by 3 to 4 points on a 10-point scale lasting over a period of two to three hours, these few strong responders may quickly achieve control of their pain, including the complete amelioration of symptoms for a day or more at a time.

Finally, as a double-edged sword, the hypnotherapist can have a quality of magic about them, the Svengali, the magician, the healer of all pathology. Clearly this perception on the part of patients is incorrect and should not be dealt with lightly. As in any clinical endeavor, patients should know as concretely and as accurately as experience and science will allow what can and cannot be expected from hypnosis and what are the appropriate applications for the treatment. The patient should be reminded that as in most aspects of life, profound and widely reaching behavioral change can rarely be achieved in the absence of real effort and dedication on the part of the patient.

Disadvantages of Hypnosis

There are some disadvantages to the hypnotic procedure that the new practitioner must be prepared to address. These include paradoxical reactions to hypnosis and slow response times or low-level responsiveness that can increase the patient's anxiety and decrease their motivation to continue treatment. A lack of understanding on the part of the clinician or patient, as well as exaggerated patient expectations that are sometimes based on inaccurate information from entertainment sources and popular media, increase the probability of negative reactions. However, as previously indicated, many of these difficulties can be eliminated with a thorough introduction to the procedure, including an opportunity to address the patients inaccurate beliefs and expectations about the process. Empirically valid disclosures are the antidote to most disadvantages related to patients participation in hypnosis.

Side effects involved with hypnosis are remarkably few. Most of the time the patient that will be of most concern falls within the 20% of patients who do not respond at all to hypnosis. That is less a side effect than a lack of efficacy of the procedure for those patients. There are a few patients, however, who present with either very fragile ego structures or who are extremely defensive, that exhibit anxiety or panic in response to hypnosis. According to the literature,[5] this has most often occurred in patients with early trauma such as Holocaust survivors, whose memories of traumatic events have been triggered accidentally. In practice, the clinician can decrease the probability of a negative occurrence by limiting hypnosis to patients with a limited but proven range of pathologies, obtaining a careful medical and personal history, and by simply watching the patient for early signs of paradoxical reactions. At the first signs of an alarm response (self-report, crying, etc.), calmly terminate the procedure and explore with the patient the reasons for the response. A thorough clinical interview with subsequent observation of the patient's behavior are part of the responsibilities assumed by the hypnotherapist.

Conclusions

We believe that hypnosis is an efficacious therapeutic tool that can be used in clinical practice, and may deserve further consideration by practitioners. However, an objective evaluation of the potential role of hypnosis in practice, as well as an evaluation of one's preconceived notions of hypnosis may prove most productive in initiating the process.

Hypnosis is an often effective therapeutic technique that may be applicable in the area of pain management. It can and should be learned in a workshop sponsored by a nationally recognized or appropriate hypnosis-related agency, in addition to an informal mentoring relationship with a more experienced practitioner. Hypnosis is a skill and requires practice on a continuing basis. However, once a basic skill level is achieved, hypnosis can prove to be a relatively complex but creative process that can provide pain relief to patients previously resistant to more conventional pain management approaches.

Many clinicians who use hypnosis as a clinical tool belong to national organizations such as the Academy of Medical Hypnoanalysts, 25 W, 550 Royce Road, Naperville, IL 60565, the American Association of Professional Hypnotherapist, P.O. Box 29, Boones Mill, VA 24065, and the American Board of Psychological Hypnosis, c/o Samuel M. Migdole, EdD, ABPH, North Shore Counseling Center, 23 Broadway Beverly, MA 01915. These sponsoring organizations provide both referral lists and opportunities to learn about hypnosis.

To some clinicians, even after reading this article, hypnosis may still seem to be an exercise in futility. To learn and then use an "old-fashioned" tool such as hypnosis may initially seem to be a distressing prospect. However, we suggest that in-depth knowledge of the hypnotic process—including its limitations and the potentially powerful and positive effects that semantic shaping can have on patients with persistent pain—should outweigh any reservation or distress related to inquiry. It is unwise to conclude with those who view hypnosis as a panacea for all physical, psychological, and psychosomatic phenomena, or the super-scientific, empirically fixed accumulators of esoteric numbers relating in some strange fashion to galvanic skin response blood pressure, respiration, and other parameters related to pain. Instead, we suggest that this procedure may deserve a second and fresh look in many clinical practices designed to serve the needs of persistent pain patients. ❑

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Brain and Behavior

Assad Meymandi, MD, FAPA

This special issue of the *Journal* is designed to elevate awareness of the brain, not just as an organ of mentation, perception, cognition, and memory, but as a marvelous, even mysterious, complex structure responsible for our rich repertoire of feelings such as anger, jealousy, hatred, love, fear, hostility, sadness, compassion, generosity, kindness, guilt, pleasure, altruism, peace, and joy. Traditionally, science has been more concerned with understanding mechanisms than with appreciating personal meanings, but to understand the brain in totality, we must pay attention to both. As a consequence of this attention, we have learned that the brain is also responsible for our complex spiritual and cosmological pursuits. Scholarship and literature about the brain have expanded rapidly, thanks to a federally funded, $2 billion-per-year research effort organized by Congress in 1990 dubbed "The Decade of the Brain." Mind/brain exploration has also been driven by advances in basic knowledge and by new imaging and biochemical technology, which allows scientists to watch the brain as it orchestrates the functions of life. Here are a few considerations:

When an outfielder leaps up to snag a fly ball, we admire the ballet-like performance and ponder it. The moment the ball is hit, the outfielder's brain begins to receive visual inputs. The eye tracks the ball; the brain computes its trajectory. Within milliseconds, millions of instructions are flashed to hundreds of muscles, telling each the exact degree of tension or relaxation required to move the body to the spot where the ball will descend. A flood of signals feeds back to the brain indicating whether each muscle is responding correctly. Finally, in a flurry of rapid-fire calculations that would outstrip the most powerful computer, brain orders muscles to propel the body upward and extend the arm. Gloved hand and baseball arrive at exactly the same point at the same time.

Or, take the case of Rajan Srinivasen Mahdevan, a native of Mangalore, India, who manages to remember the first 31,811 digits of the number pi. This feat is achieved through the function of hippocampus and amygdala, two anatomically small portions of the limbic system, and nucleus ceruleus.

What part of the brain is responsible for the sudden and overwhelming feelings of warmth and spirituality that sweep one's soul when listening to a favorite composer? Does the brain contain the soul? What goes wrong with the dopamine and acetylcholine neurotransmitting systems in the brain of an Alzheimer's patient with no memory, feelings, or personality, producing the unwelcome transformation of a person into a human object? What happens to the brain's indoleamine and serotonin system in clinically depressed patients whose pain of living is so great that death is welcome?

What about the ascetic dervish who fasts for 40 days and finds ecstasy in solitude and meditation? And what goes on in the brain of violinist Medori, who at age six was able to play classical music without looking at the notes?

These are but a few examples of the myriad secrets of this three-pound organ we call the "brain." The spin-off of the "Decade of the Brain" is a better understanding of the its role in healing, spirituality, and wellness. For example, meditation has been shown to enhance healing. The neurophysiology of meditation has been worked out since in studies from London's Maudsley Hospital, Sweden's Karolinska Institute, New York's Columbia Hospital, and the National Institute of Mental Health. Those studies have demonstrated that meditating for 20 minutes, morning and night, decreases oxygen consumption and the heart rate below that found in sleep. It also increases the blood flow to muscles and organs, decreasing the level of lactic acid and low-density lipoproteins.

In this issue, the article on "The Psychology of Ecstasy in Sufism and Yoga," explains the nature of these disciplines. Eastern philosophies have much to offer technologically advanced Western medicine for enhancing the dimensions of healing. Thomas Tweed, a specialist in religion, examines the paradigm of religion and healing in his article. Fred Jones, a nephrologist, contributes a paper on sex, the mind, and society. Judith Farquhar, an expert in Asian studies, completes this discussion with "Chinese Medicine and the Life of the Mind."

Finally, a personal note: helping prepare these articles has made me much more aware of the under-appreciated gift of the brain. The 11 billion neurons at our command serve us by allowing us to think, communicate, remember, love, and enjoy and celebrate life. For this precious gift, I am humbly thankful. ❑

Dr. Meymandi, a guest editor of this issue, is a Psychiatrist at 3320/218 Executive Drive, Raleigh 27609. He is a member of the *Journal*'s Editorial Board.

The Psychophysiology of Ecstasy in Sufism and Yoga

Carl W. Ernst, PhD

For millennia, visionaries and prophets have spoken of higher orders of awareness, compared to which ordinary perception is a diminished level of existence. All cultures have had specialists who attempted to master the "archaic techniques of ecstasy," as historian of religion Mircea Eliade called them. Siberian shamans, North American medicine men, and other practitioners of the sacred were renowned for their "ascents to heaven," by which they obtained cures for the sick as well as knowledge of the spirit.

The scientific and technical achievements of the European Enlightenment created a mood that was not friendly to spiritual ecstasy. The monopoly over nature claimed by the new scientific-technical establishment did not permit unauthorized rival explanations. Skeptics like David Hume, Karl Marx, and Sigmund Freud proclaimed religion to be an illusion. When consciousness came to be defined exclusively as an epiphenomenon of the brain in a materialistic universe, visions and revelations became mere hallucinations, disorders of the nervous system.

The notion of mystical experience as a pathological condition has not triumphed, however. As the 20th century ends, religion and spirituality have taken on an importance that would have baffled Auguste Comte and his ilk, who proclaimed that science had replaced religion. True, much of the current emphasis on religion lies on the social level of community and politics, but there is a tremendous interest in spiritual experience as the means by which individuals come to terms with the ultimate. For instance, an estimated more than five million Americans now practice some form of yoga. For many, yoga is primarily a form of relaxation and physical training, but it is undeniable that yoga derives from a complex psychophysical system of thought and discipline linked with ancient spiritual traditions.

In this paper, I describe briefly some of the chief concepts and techniques associated with higher consciousness and mystical experience in two traditions, Sufism and yoga. Certainly there is a physical aspect to meditation that is associated with bodily asceticism, and some of its benefits may be explained by the physical and neurological effects of fasting, sleep deprivation, etc. But I want to suggest that we pay attention to the internal explanations that have been developed over centuries by full-time practitioners of these techniques. If, in fact, these methods "work" in some fashion, then the explanatory psychophysiological systems associated with them deserve a look as well. It seems safe to say, in any case, that the concepts of Sufi and yogic meditation are of a different character than standard medical doctrine.

Sufism

Sufism is the mystical tradition associated with Islam.[1] The Prophet Muhammad (d. 632) and the Qur'anic revelation that he brought are the sacred sources of Sufism. The name "Sufi" derives from the Arabic word for wool and refers to the woolen garments worn by ancient Near Eastern ascetics and prophets. The early mystics of Islam may have been familiar with older spiritual traditions associated with Christianity, Judaism, or Zoroastrianism, but by the 12th century the Sufi movement was a fully developed movement found in Muslim countries from India to Spain.

Sufi meditation techniques originated in the devout recitation of prayers, in particular the Arabic names of God as revealed in the Qur'an. The term for this recitation is *dhikr* (or *zikr*), meaning "recollection," performed either alone or in congregation. Its aim is to concentrate the heart so that it is filled with God and nothing else. The manuals of Sufi practice describe *dhikr* as a multilevel process, in which all of the faculties are employed, beginning with the tongue as the outermost, then engaging the heart, the soul, the spirit, the intellect, and the innermost conscience called the secret. These different levels are part of a psychophysical continuum that allows approach to the subtlest level of consciousness. Prayer formulas and divine names are recited (either subvocally or aloud) and consciously projected into different parts of the body. Each of

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the names of God has the power, when repeated frequently, to create its characteristic quality in the psyche of the practitioner of *dhikr*. For instance, repetition of the name "the Merciful" (*al-rahman*) brings about feelings of mercy and compassion in the heart, but beginners should avoid names such as "the Overpowering" (*al-qahhar*) because of the strong psychic effects that can be unleashed.

In advanced techniques of meditation masters trained disciples during demanding 40-day retreats. In earlier times the emphasis was on theological themes such as the fear of God or the love of God. The growing sophistication of the tradition led to an articulation of multiple psychological "stations," which the soul could traverse in sequence like a ladder carrying one closer to God and, in the process, encompassing the totality of psychic possibilities available to humans. Some lists described as many as a thousand spiritual stations, balanced by unpredictable "states" considered to be the result of divine grace.

The Sufi analysis of mystical experience was grounded in a complex psychophysiology of the body's subtle centers (*latifa*, plural *lata'if*). Drawing on the ancient cosmological symbolism of the seven climes, this teaching described seven subtle centers, each linked with a type of human being and with a particular prophet mentioned in the Qur'an. Each subtle center also was the locus of a mystical experience of light in a particular color. One account of six subtle centers localized the heart (*qalb*) two fingers below the left breast, the spirit (*ruh*) two fingers below the right breast, the soul (*nafs*) beneath the navel, the secret (*sirr*) in the middle of the breast, the mystery (*khafi*) above the eyebrows, and the arcanum (*akhfa*) at the top of the brain. Rather than following from any fixed neurological concept, this complex structure provided a flexible meditation device used to develop a subtle body for mystical experience, in a process that might be compared to the modern concept of virtual reality.

Visualization was a prominent aspect of meditation. Meditation manuals describe a series of visions that recapitulate the hierarchical structure of the universe, from the lowest minerals to the divine presence and the cosmic realms beyond time. The ultimate goal was to emulate the heavenly ascension of the Prophet Muhammad and to reach the presence of God. In the process, many remarkable experiences have been recorded. For example, the visionary diary of Ruzbihan Baqli (d. 1209) is filled with astonishing encounters with God, the prophets, the angels, and the Sufi saints. These experiences could not be guaranteed by simply following a given procedure, however. For Ruzbihan, the encounters with God were the product of unmediated divine grace.[2]

Yoga

Yoga, which originated in India, is one of the most widely spread systems of meditation in the world.[3] On the philosophical level, it was originally expounded in ancient times in the Yoga Sutra of Patajali, and it constituted one of the six classical philosophical systems of India. Patanjali described yogic practice in terms of eight categories called "limbs": restraints, disciplines, postures, breathing, detaching senses from external objects, concentration, and the highest consciousness, called *samadhi* or "enstasis" as Eliade translated the term. Yoga in various forms played a major part in important Indian religious texts such as the Mahabharata and the Bhagavadgita. We see the term in compound words such as karma yoga (the yoga of action), jnana yoga (the yoga of knowledge), and bhakti yoga (the yoga of love and devotion). But mostly we are concerned with the increasingly specialized physical practice that came to be associated primarily with the term hatha yoga (literally, the yoga of violent force).

Hatha yoga, which became popular about a thousand years ago, uses complicated techniques, usually accompanied by a minimum of metaphysical explanation. The founders of hatha yoga, the legendary yogis Matsyendranath and Gorakhnath, were believed to have learned the techniques from the Hindu god Shiva. Using a physiology of subtle nerve and breath control, which may have quite ancient roots, hatha yoga conceives of a subtle body containing seven chakras or "circles" connected by nerves (other systems counted four or nine chakras). Meditative exercises typically involve awakening the powerful psychic energy in the lowest chakra at the base of the spine, visualized as a coiled snake (kundalini), and causing it to ascend to the chakra at the top of the skull. Each chakra is associated with a yantra or diagram, a mantra or chant, and one or more gods. The yogi attempts simultaneously to arrest the breath, the activity of the mind, and the emission of semen in order to gain extraordinary powers and long life. The basic emphasis of hatha yoga is on the human body as the medium for the attainment of immortality and salvation. Many techniques of bodily purification, postures for meditation, and breath control have been described in hatha yoga texts. Since these are in general presented with a minimal metaphysical elaboration, they have been adaptable to a variety of religious contexts. Thus yogic and related tantric practices are widely distributed among Hindu, Buddhist, Jain, and even Sikh traditions throughout India, Tibet, and the Far East.

A Comparison

Sufi and yogic meditation techniques have a number of similarities, which caused early observers to speculate that they were essentially one system that originated in India and spread to Muslim countries. Superficial similarities between their psychophysiologies (for example, the subtle centers of Sufism and the chakras of yoga) seemed to reinforce the concept of cultural diffusion. In fact, it is difficult to marshal historical evidence for a yogic basis for Sufi practice (Figure 1, next page, shows a rare 19th-century Urdu example of a juxtaposition of yogic and Sufi physiologies). Further afield, in China or the eastern Mediterranean, there are Taoist or Christian meditative techniques that rely on extensive chanting of sacred names or formulas together with control of breathing and other physiological applications. The famous "Jesus prayer," developed by early Christian monks, is a good example of such technique. It has been preserved in Orthodox Christianity, and is well described in the late 19th-century Russian classic, *The Way of A Pilgrim* (and echoed by J. D. Salinger's *Franny and Zooey*). Interestingly, the anonymous author of the Russian book maintains that yo-gis and Sufis borrowed (and bungled) meditative techniques of the Christian church fathers: "It was from [the Greek Orthodox saints] that the monks of India and Bokhara took over the 'heart method' of interior prayer, only they quite spoiled and garbled it in doing so."[4]

An attractive alternative to the cultural diffusion theory supposes that hidden potentialities in the mind and body can be unlocked by sufficiently prolonged use of meditative techniques that naturally arise in religious traditions. But many questions remain. Whether we are concerned with Sufism, shamanism, Christian monasticism, or yoga, the practitioners inform us that not only their particular psychophysiology but also their theology is crucial to the success of the method. Their universe is not impersonal, but is activated by the same kind of consciousness that humans experience—recalling the "anthropic principle" of some recent philosophers of science. On one hand, the existence of long traditions of meditative training suggests that there is an experiential basis for mysticism. On the other hand, the divergence between different psychophysiological systems and theological doctrines indicates that we are dealing with something more than an unchanging biological substratum. Disciplined human consciousness may have the power to fashion the intensified levels of psychological experience known to Sufis and yogis.

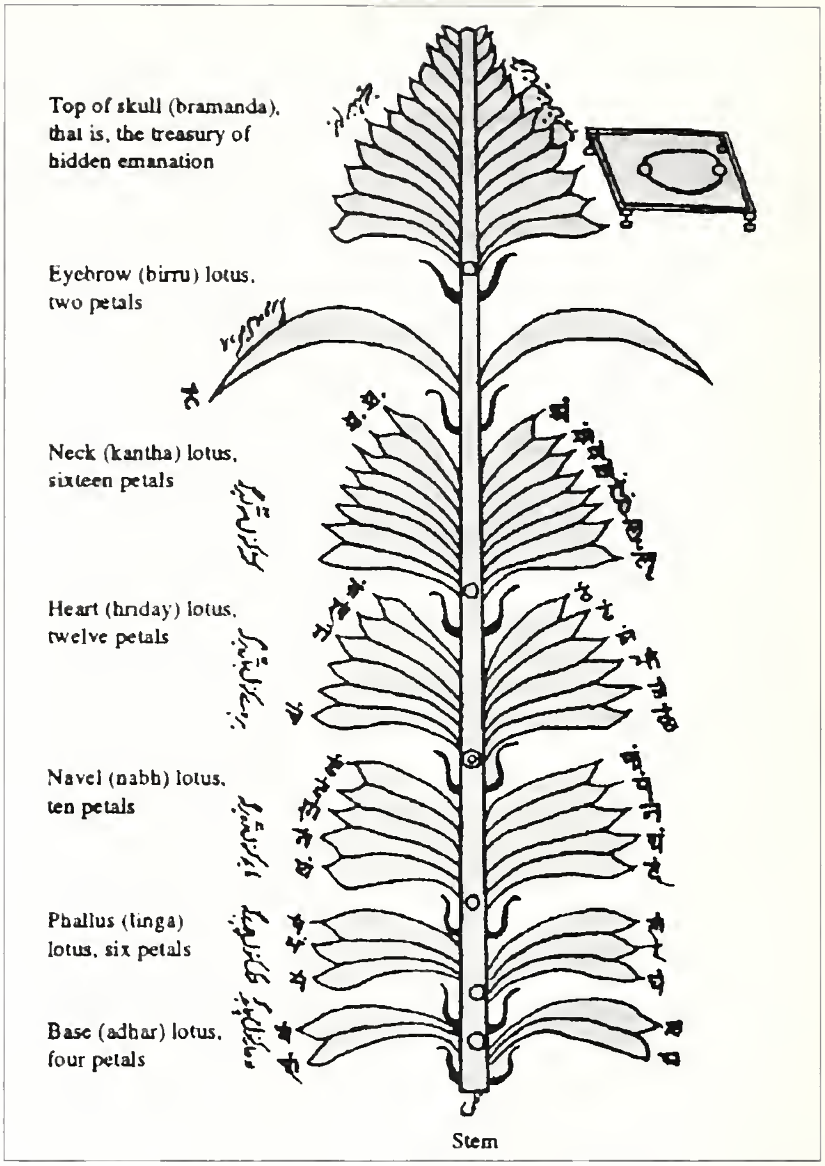
Top of skull (bramanda), that is, the treasury of hidden emanation
Eyebrow (birru) lotus, two petals
Neck (kantha) lotus, sixteen petals
Heart (hriday) lotus, twelve petals
Navel (nabh) lotus, ten petals
Phallus (linga) lotus, six petals
Base (adhar) lotus, four petals
Stem

Fig 1: The lotus structure of chakras according to Ghawth 'Ali Shah Qalandar (19th c.) juxtaposes yogic and Sufi physiologies. Urdu notations identify the physical locations of each chakra.

These speculations aside, I must confess that it is difficult to establish with any confidence the relationship of the psychophysiology of ecstasy to modern concepts of neurophysiology and the brain. Today's industrial society permits few individuals to devote the years of full-time practice necessary to master these disciplines. A limited amount of research on the brain waves produced during meditation has produced no conclusive or dramatic results. Even if we could hook up a Sufi master or yogi to our most advanced apparatus, would the brain-wave readings finally tell us anything about the ultimate state of consciousness? There may be a point where individual spiritual experience cannot be replaced by institutional science. ❑

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Religion and Healing

Cultivating a Respectful Ambivalence

Thomas A. Tweed, PhD

Last winter I traveled with my father-in-law, Bill, a retired orthopedic surgeon, to a Roman Catholic shrine. I undertook the journey out of professional obligation: I write and teach about religion in the United States. He took the trip partly from curiosity about me ("what in the world does this guy do for a living?") and partly from personal devotion. Bill is a devout Catholic, but one who has never lost the rationalist inclinations that served him well as a physician. When faced with broken bones and torn ligaments, he did not prescribe prayer. He did what most physicians would do, he searched for natural causes and solutions. He examined x-rays and put on casts.

That was why it was so intriguing to me—you see, I have my curiosities about him too—to hear of his reactions to miracle cures. I learned of his views that day at the shrine. While we were in the gift shop, the nun behind the counter told me about recent "alleged miracles" there. ("We have to say 'alleged' until they are verified," she reported regretfully.) When I heard this, I turned and gestured to my father-in-law, to include him in the conversation. "He was involved in the canonization of St. John Neumann," I said. "Really?" she asked, obviously impressed by the news that he had confirmed one of the three miracles attributed to the 19th-century American bishop. Other Catholic pilgrims gathered around him near the gift shop counter; one ran off ("I have to get my mother to hear this"). Then Bill told the story, unpretentiously and matter-of-factly.

A Miraculous Cure

"In the early 1970s I had a patient, a young boy, who had a bone tumor in his thigh," Bill began. He advised the boy's mother that they would have to amputate to prevent the spread of cancer. She steadfastly refused, preferring prayer instead. She took the six-year-old to the shrine of John Neumann in a downtown Philadelphia church. There in the dark interior, and in front of the preserved remains of the future American saint, the family prayed for healing. Bill remained skeptical. Miraculous cures were not part of his daily experience as a physician. He was respectful, but doubtful, about using prayer as a treatment plan.

A lesion was found in the boy's lung, and the femoral tumor was no better. Bill decided that he had to convince the mother to allow amputation. Then the unexpected entered. At the next examination, both the bone tumor and metastatic lesion had disappeared for no apparent reason. Even then, Bill told the rapt crowd in the shrine gift shop, he did not accept supernatural interpretations. "The results must be wrong," he said. "There must be some other (natural) explanation." But, as you have guessed, he and the other consulting physicians found none. Mysteriously, the boy was cured.

News of the cure made its way to church officials. With his medical skepticism challenged but still firmly in place, Bill reluctantly agreed to speak with the ecclesiastical investigators. The Roman Catholic church, as you may know, is very cautious about making saints and proclaiming miracles. It demands proof: x-rays, charts, tests. It demands testimony from the attending physicians. My father-in-law, somewhat perplexed and embarrassed by the events, reported the facts of the boy's case to the investigating priest who visited his home. In 1977, after two other confirmed miracles had been attributed to John Neumann, the pope officially declared that Neumann could be venerated as a saint.

Healing and Faith

As in this case, healing is often linked with faith. Even if my father-in-law—and more than a few readers of the *Journal*—remain uncertain, the crowd at the gift shop knew what had happened to the boy with the femoral tumor: God had miraculously cured him. Their attitude is not surprising. In a number of religions, from traditions that claim hundreds of millions of followers to small tribal religions, women and men turn to their

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faith for mental and physical healing. Shamans of the Tunguz people of Siberia "travel" to other worlds in mystical states to bring back medical cures for their people. Medical practitioners among the Balahis of central India speak with the afflicting spirit while trying to diagnose the illness. In the Andes of Peru, diviners consult mesas or ground cloths with representations of the cosmos on them to discern the illness and identify its cure. The Buddha is portrayed as a great healer in the Pali canon, among the earliest Buddhist sacred writings. In the Hebrew Bible God announces that "I am the Lord, your physician" (Exodus 15:26). Christian scriptures attribute miraculous cures to Jesus, and Pentecostals take that seriously as they raise their arms in worship to invite God's healing spirit.[1]

If religion and healing have been so interconnected, it is not surprising that Catholics go to shrines to find cures. They visit Lourdes for holy water, Chicago's Shrine of St. Jude for holy oil, and New Mexico's El Sanctuario de Chimayó for holy dirt. There they petition Mary and the saints for healing. There, pilgrims believe, their prayers are answered. In response, the faithful send letters, donations, and gifts of thanks. In shrines throughout the Mediterranean and Latin America, pilgrims place wax limbs and crutches in shrine chapels as signs of gratitude for the cures granted.

"...it might be in your patient's best interest to suspend disbelief, to cultivate ambivalence about the psychological and physiological effects of religious ritual."

At a Cuban Catholic shrine in Miami where I did research for five years, I often encountered pilgrims who had come to pray for health. Consider two examples. One spring afternoon an elderly couple walked slowly to the front portal of the shrine, the wife staying nearby as her husband, using an aluminum walker, inched toward the altar inside. Despite his pale complexion and trembling arms, he smiled meekly. I tried to talk with him, but his wife intervened, protecting him from overexertion, I suspect. The wife explained that they had prayed that his recent operation would be successful. The Virgin Mary complied. So they decided that right after checking out from Mercy Hospital they would visit the adjoining shrine to offer thanks.

On another day I encountered three visitors, two of them in wheelchairs, who came for healing. José, a 36-year-old wearing a Georgia Tech cap maneuvered his chair with great skill up the winding ramp to the left entrance. It was immediately evident that he had been in the wheelchair for some time. He visits the shrine often, he later revealed: "[It's] the only place I can kneel and pray." He did not mean that literally, since he does not get out of his wheelchair at the shrine altar; he meant that the sanctuary is spiritually accessible for him. And that day in June he brought two Brazilian friends with him, an 11-year-old in a wheelchair and her mother. José explained that doctors recently told the mother that there was no hope for her daughter, but he did not want either of them to accept that. That is why they made the pilgrimage. "To me this is a special place, where miracles happen. I brought this lady with her little girl to ask for a miracle. She needs one. Faith can heal." With the mother fighting back tears and the young girl quiet, even eerily resigned, the three approached the altar to consult Mary.[2]

A Suggestion

I never learned what happened to that young girl, but what if she later had an inexplicable recovery? What would we make of that? How do we interpret the reported cure of the young boy with the tumor in this thigh? Some readers will quickly dismiss all claims of miraculous cures, suggesting that there are natural explanations, even if they remain (for the moment) elusive. I must admit that I, personally, am more than a little skeptical. And I would not presume to pass judgments about medicine or offer advice about treatment. Those are beyond my competence. Still, physicians might find it useful, as I have in my work, to cultivate a respectful ambivalence about faith healing. In a sense, we both have role-specific professional obligations to do so. For me, as a scholar of religion, it is important that I take seriously the self-reports of the people I study. To quickly dismiss as superstition their accounts of miraculous cures would be to disrespect them, and it is unlikely to help me learn much about their religious lives. For medical practitioners, it is important to respect the role of the psychological in healing (within limits, of course, since there are obligations to safeguard the physical well-being of patients). Scientific studies clearly show that the physiological and the psychological are intimately connected. It makes sense, then, to respect patients' religious beliefs, even if you remain (like me) more than a little dubious about faith healing. Only you can decide how to deal with the moral dilemmas that arise when patients refuse treatment on religious grounds, as when the boy's mother refused the amputation my father-in-law had advised. As Bill did, however, it might be in your patient's best interest to suspend disbelief, to cultivate ambivalence about the psychological and physiological effects of religious ritual. You might not find yourself confronted with miracle cures, as my father-in-law was, but openness to the complexity of human life can only serve your patients well. ❑

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Chinese Medicine and the Life of the Mind

Are Brains Necessary?

Judith Farquhar, PhD

Think about it. In the everyday life of your body, how do you experience the activity of your brain? Is it like your heart, which can be felt in the pulse or as a beating in the chest in moments of tension or quietness? Is it like your stomach or intestines or urinary bladder, which can intrude on a perfectly taken-for-granted existence with sometimes embarrassing reminders of their functions? Of course, we do think on a daily basis. And we think that thinking is a function of the brain. But the connection between mind (thinking) and brain, though a widely shared feature of Western common sense, remains a very difficult subject for either science or philosophy to theorize about. The very fact that Western tradition has worked so hard to conceptualize the relationship between anatomical brain and living thought suggests that "brain" itself is not a self-evident experience in the life of the body.

On the other hand, we accord the central nervous system (CNS) a powerful role in orchestrating the functions of all the organs, including those we think we feel and those we only know about. Historically, much of what biomedicine knows about CNS function originated in the convergence of hospital-based observation of head injury and neurological disease with knowledge based on dissection. The anatomical and clinical revolution of early modern Europe gave rise eventually to the mass of global institutions now grouped together as the biomedical sciences. Biomedical understanding of CNS activity goes far beyond the insights of gross anatomy, but the anatomical image of a central processing unit ramifying outward in a complex network of nerve fibers has not been replaced. The structural model of centrally coordinated information transfer lies behind much modern medical thinking and therapeutic intervention.

A Chinese Way of Thinking About the Brain

There are other ways of thinking about brain, however. Some of them—traditional Chinese medicine is one—have incorporated ideas about that mass of gray matter at the top of the spinal cord into complex and sophisticated systems of diagnosis and therapy. They have done so without the benefit (or, some would argue, the handicap) of an anatomical tradition. The Chinese doctors who gradually accumulated, over almost 2000 years, a record of clinical observations, therapeutic trials, and physiological explanations, worked without the structural model—skeleton, muscles and tendons, nerve network, discrete organs—that has become second nature to us. Could the Chinese have relied on other models as they developed and transmitted their specialized knowledge of illness and health? This is an interesting question in relation to the brain since contemporary literature of Chinese medicine accords the brain a rather unimportant place in the dynamic system of the living body.

Let me explain. Chinese medicine as practiced in China today is built on a heritage of medical knowledge that is very diverse, but which can trace its development more or less continuously from the profound metaphysical thought of the classical period of Chinese philosophy (770 BCE-220 CE). This tradition emphasizes five great systems of function in the human body, centering on five organs: the heart, lungs, liver, spleen, and kidneys (no brain in this list!). Though the anatomical organs are recognized as discrete entities with stable positions in the body, their structural existence does not interest Chinese doctors. Rather these organs are seen as dense centers of dispersed systems of functions—the heart, for example, directs blood flow, stores vitality (known as *shen*), produces the vessels of the body, and manifests itself in the color and brightness of the face and in various observable characteristics of the tongue. It has a special relationship with the small intestine subsystem, in the sense that disorders of the small intestine can usually be attributed to a problem of the heart system. This vision of heart system functioning is both more

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and less ambitious than biomedicine's understanding of the heart. In one sense, the Chinese heart is both inseparable from the vessels and vitality of the body as a whole, and also crucial to the proper functioning of digestion and elimination. Such a heart could not, for example, be transplanted. On the other hand, the heart does not appear, in the Chinese medical vision, to mechanically cause anything. In this sense, it seems weak and unimportant compared to the muscular organ of biomedicine. The Chinese medical heart is central to the operations of blood and vessels, but it is no mere pump lying at the center of a plumbing system.

"The Chinese medical heart is central to the operations of blood and vessels, but it is no mere pump lying at the center of a plumbing system."

Chinese Metaphysics

This is where ancient metaphysics comes in. Chinese philosophers of the classic period presumed that the world was a very active place. Things happened of themselves, and everything was imbued with an intrinsic tendency to change. The forms of change varied, and the qualities of transformation—speed, shape, regularity, connective and disjunctive tendencies—were of great interest to observers, but the efficient causes of change were seldom investigated. In approaching this cosmology, so very different from our modern way of thinking, it is useful to think of the universe as a vast living organism. Joseph Needham, in his multivolume study, *Science and Civilization in China*, spoke of "resonance" among effects: "things of the same genus energize each other." In the cardiovascular system of Chinese medicine then, the resonant body sites—heart, blood, vessels, face, tongue, and small intestine—"energize each other." Their structural connections and mechanical interactions are not important: what counts is their dynamic kinship.

The Chinese vision of the heart—which I have vastly oversimplified here—seems rather closer to our biomedical understanding of CNS function than to our vision of the classically mechanical circulatory system. Yet Chinese medicine, as it happens, pays very little attention to nerves, spinal cord, or brain. However attractive it might be to think of the biomedical nervous system in a "Chinese" way, as a dispersed network of dynamic functions with a dense center in the brain, the Chinese tradition has *not* thought of it that way. On the contrary, the brain is one of the most passive sites known to Chinese medicine. The brain is referred to as the "reservoir of marrow" (known as *sui*). Chinese medicine asserts that marrow exists in the body, meaning not only the soft interior of bones but also the substance making up the spinal cord and some other soft tissues. It is difficult to find much writing in the Chinese medical archive on the subject, but the remarks that do exist suggest that clinicians saw marrow as being produced throughout the body, gathering in the region of the kidneys, and traveling up the spinal cord to collect in the cranium. In this they were probably influenced by metaphors for body experience that were popular in Taoist and other meditative disciplines.

The grouping of elements (marrow, nerve, and brain) that are, to us, dissimilar, is perfectly reasonable for a culture in which the processing of animal carcasses for food (and the occasional examination of corpses for forensic purposes) were the chief method of learning about the structure of the mammalian body. Medical people of the great Chinese tradition were not ignorant about the contents of bodies, but they directed their attention elsewhere. They were more interested in the life of the human body than in its architecture. (In this regard, it is interesting to note that the contemporary Chinese word for physiology, *shenglixue*, means the study of the patterns of life, while the word translated as pathology, *binglixue*, refers to the study of the patterns of illness. The idea that a pathologist would examine the dead is quite foreign to the thinking of Chinese medicine.)

The Holism of Chinese Medicine

But surely (you will object), these systematizers and clinicians, so interested in the life of the human body, must have concerned themselves with thought, memory, language, spiritual life, the whole life of the mind? All clinicians encounter pathologies of speech and memory, as well as syndromes in which disordered thinking seems inseparable from the progress of disease. Beyond the clinic, and leaving aside emotional disorders such as depression, anyone who has ever been ill knows that the first thing to go with physical illness is mental acuity. How many of us are capable of scintillating conversation while suffering from a bad head cold?

"Doctors practicing traditional Chinese medicine make no radical divide between disorders of the body and those of the mind."

Chinese doctors take such debilities of the mental life quite seriously as symptoms. Slow speech, loss of memory, wild talk, groaning and sighing, excessive dreaming, general spiritlessness are frequently mentioned in case histories, and appear in symptom lists alongside discomforts and disorders of eating, respiration, sleep, defecation, urination, and menstruation. The mixing of what seem to us dissimilar manifestations of disease is not sloppiness or confusion; it is an expression of an entirely different way of understanding and experiencing the body. Doctors practicing traditional Chinese medicine make no radical divide between disorders of the body and those of the mind. Every disorder biomedicine would call "psychiatric" is analyzed in Chinese medicine as a whole body problem, usually stemming from debility or hyperactivity of one of the five great systems centering on the heart, lungs, liver, spleen, and kidneys. Serious disorders of thought or language are usually traced to the heart, liver, or kidney, since these systems are especially involved with the more volatile and rapidly transforming substances of the body (spirit, energy, and seminal essence).

Hence Chinese medicine's reputation in the West for "holism." Hence, perhaps, its appeal to us in an era when it has become common to trace the shortcomings of our civilization to "the mind-body divide." Few American patients who encounter fragments of Chinese medical practice in the world of "alternative medicine" completely abandon the mind-body dualism of their own culture in order to embrace East Asian holism. Many such patients are not only ill, but are on a spiritual quest that usually interests Chinese doctors as little as it does the internist at an American HMO. Perhaps American consumers of Chinese medicine see virtues in it that are, for them, concrete and consistent with ordinary bodily experience.

Chinese medicine, after all, sees the brain as the product—not the cause or source—of a whole-body process of production, dissemination, accumulation, and elimination. Mental symptoms are attended to very closely, as are all symptoms, but not as evidence of brain pathology. Rather they are signs that certain end-products of general health—reflection, memory, conversation, analysis—are suffering depletion. Returning the functional systems that govern the health of the whole body to vigorous activity can allow the normal and eminently human life of the mind to regain its natural vitality. ❑

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Are Men's and Women's Brains Different?

Fred S. Jones, MD

Are men's and women's brains different? Ask that question 50 years ago and the answer would have been a decisive "Of course they are." Historically, society has recognized broad differences in the way men and women act and think. Men are more aggressive; women more nurturing. Even today, many of us sense that men and women think differently in many ways.

But masculinity and femininity also are defined by physical as well as behavioral characteristics. The sexes are physically, hormonally, and genetically dissimilar. Why would the brain not be influenced by the genes and hormones that define the body? The human brain, like the body, is sexually dimorphic. That dimorphism, however, is the product of more than genes and hormones; the neuronal pathways of the brain are developed through intimate interaction with the environment of the growing individual. The myriad cell-to-cell connections that form the neuronal network develop prenatally—and also postnatally from exposure to visual, auditory, and various cognitive stimuli. In short, our brains become what we teach them to be, given their genetically defined templates.

The fact is, we barely understand the complex mechanism that makes the brain think. Nevertheless, scientists have sought to determine whether there are anatomical differences between male and female brains. There are anatomical differences. The male brain is about 10% larger than the female brain, but the difference is proportional to the larger body size of men. When charted as a function of height or weight, the difference between male and female brain sizes almost disappears.

Brain Differences: Beyond Neuroanatomy

Sex-specific brain asymmetry of the temporal lobes has been reported, but most studies of gender differences in anatomical structure of the brain focus on the corpus callosum and the hypothalamus. The corpus callosum is the large mass of nerve fibers connecting the left and right cerebral hemispheres. Many studies have failed to show any gender differences here, but some have described male/female differences in the size and shape of its various parts. Those differences probably develop after birth and possibly not until adolescence.

The hypothalamus regulates the menstrual cycle through secretion of gonadotropin-releasing factor. It also governs such impulses as hunger, anger, and sex drive; it controls release of prolactin and synthesis of oxytocin, which cause lactation and milk flow in women. There are discernible gender differences in size and shape of various hypothalamic nuclei, including the suprachiasmatic nucleus, the sexually dimorphic nucleus, and the interstitial nucleus of the anterior hypothalamus. Some studies have claimed to identify differences in hypothalamic nuclei of homosexuals and heterosexuals. As with the corpus callosum, many reported hypothalamic findings have not been confirmed (or have been contradicted) by independent studies.

All of the sex-specific brain differences are extremely subtle. Most importantly, virtually no study provides morphological support to explain behavioral differences between the sexes. It is, at present, impossible to determine whether the anatomical differences of male and female brains have any correlation with the way men and women think. It seems simplistic to believe that the complex behavior patterns of men and women could be ascribed to gender differences in small, isolated areas of the brain. As the neurobiologist Roger Sperry pointed out in his Nobel laureate address "[T]he more we learn, the more we recognize the unique complexity of any one individual intellect and the stronger the conclusion becomes that the individuality inherent in our brain networks makes that of fingerprints or facial features gross and simple by comparison."[1] Attempts to ascribe differences in male and female behavior to tiny differences in the corpus callosum or hypothalamus is reminiscent of the efforts of phrenologists who believed they could determine human nature and character by studying the conformation of the skull. Basing differences in verbal or spatial testing skills of men and women on slight differences in brain anatomy inappropriately localizes extremely complex neural processes that involve diffuse and poorly understood areas of the brain.

The search for differences between male and female brains has moved outside the discipline of neuroanatomy. Active research in genetics, endocrinology, developmental psychology, and radiology is exploring differences in how men and women think. Male and female embryos appear almost anatomically identical until the sixth week of development. At that

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time, in males, the Y chromosome directs transformation of the sexually undifferentiated gonad into an embryonic testis. The testis then synthesizes testosterone which influences the development of the male genital system. Some scientists believe that gender differences in adult behavior result from the different hormonal environments encountered in utero. Support for this contention comes from studies showing that (in some animals) testosterone directly affects brain development. Certain male songbirds for example, develop the area of the brain responsible for courtship singing only under the influence of testosterone.

The Role of Genetics and Hormones

Unlike the case with animals, the influence of genetic and hormonal signals on brain development is quite speculative in humans. Clearly, environmental factors, particularly during the first few years of life, influence human gender identity and behavior. The relative influence of nature versus nurture on gender identity and behavior remains a perennial controversy.

A number of studies have studied the role of prenatal hormones on the development of aggressive behavior in humans. Subjects have included boys and girls with the adrenogenital syndrome and children born to mothers who took progesterone or estrogens during pregnancy. The results and conclusions of these studies are contradictory and inconclusive.

Beyond genetic and embryonic hormonal influences lie the effects of androgens and estrogens on human behavior in adults. Substantial scientific evidence shows that testosterone increases aggressive behaviors in adult rats and mice. For example, castrated male mice fight less than normals, but fighting increases to usual levels after treatment with testosterone. Of course, animal studies do not necessarily imply that a similar correlation exists in humans. Most studies show that men are more aggressive than women, but the biological basis for the difference is not known. Studies looking for correlations between testosterone levels and aggressive behavior in humans have provided varying results, depending on the methodology used and population studied. In general, the weight of the evidence suggests no reliable correlation.

Defining Gender Roles in Society

Subtle differences in cognitive function between men and women do exist. In general, women excel in verbal skills, and men in mathematical and visuo-spatial tasks but the gender-specific differences are very small. For instance, about 95% of the variation in spatial skills of a large population has nothing to do with being male or female. Across the general population, men and women have the same average level of intelligence, but some studies suggest that, among the brightest students, the ratio of men to women with very high levels of spatial skills may be as high as two to one. The relative contribution of biological or environmental influence toward that difference is unclear.

Our society's fascination with the tiny anatomical differences between male and female brains arises to a large extent from social and political battles about defining gender roles in society. Liberals see gender as a cage. They argue that men and women are fundamentally the same, and differ only in external physical characteristics. They believe that men dream of nurturing children and that women long to be aggressive and tough, free from the bonds of child rearing. They hope for an egalitarian, unisex society where men and women share equally in raising children and work. Conservatives, on the other hand, see men as more aggressive and women as more nurturing because of intrinsic biological differences. They believe that masculinity and femininity are natural expressions of genetic differences between men and women, not contrived social constraints that impede happiness.

The debate about the true nature of gender differences is almost constantly being argued. Should women fight in military combat? What are the consequences of women working full time and men raising children? Is the acceptance of androgenous paternity harmful or helpful? Is homosexuality a natural phenomenon? Why do women earn less money than men? Is affirmative action necessary to rectify the inequality? All of these questions are predicated on the more fundamental questions of how and why men and women differ. Sociologists, anthropologists, political scientists, and social commentators of all persuasions have turned to biological scientists and medical doctors for answers to those questions. It is assumed that physicians, being experts on the human body, can unravel the riddles of gender. Physicians study anatomy, physiology, endocrinology, embryology, psychology, and neurology. If biological differences can explain the observed social differences between the sexes, surely the power of pathology, magnetic resonance scanners, molecular genetics, and the scientific method can dissect out correlations and draw conclusions.

In truth, however, we have only vague generalized theories to explain why men and women behave and think differently. Those theories try to argue from small differences in brain anatomy and in cognitive testing to large social differences between men and women. The speculations often become politically motivated and emotionally charged. They are superimposed on and transmuted by contemporary unscientific perception of how men and women appear to think.

It seems clear that there are real, if small, differences in brain anatomy and cognitive function between men and women. There are sexually dimorphic genetic and hormonal influences on the brain, but no gender difference is very large and there is nearly no morphological support for behavioral differences between the sexes. Our rudimentary understanding of how our brains think limits our ability to interpret the described anatomical differences. Social and political forces influence our explanations of the limited scientific data available. ❑

Reference

1 Fausto-Sterling A. Myths of Gender. New York: Basic Books, 1992, p 49.

Carolina Physician's Bookshelf

Searching for Memory

by Daniel Schacter, PhD (Basic Books, 398 pages, $27)

Reviewed by Assad Meymandi, MD, FAPA

Searching for Memory is about the mysteries of those parts of the brain responsible for memory—and more. The author dissects, minutely analyzes, and skillfully mounts in a display case fascinating components of memory. He then interprets what is on display and synthesizes the parts into a whole that makes clinical sense.

Schacter begins by quoting from Gabriel Garcia Marquez's epic novel, *One Hundred Years of Solitude*. A memory-eating plague invades a village, rendering all villagers unable to recall even the names of their children. To keep up, they label everything: This is a plant; this, a cow, a pig, a hen, etc. The story dramatizes a world without memory, where everyone is a stranger, where symbolic communication cannot be used and where society as a whole cannot function. Schacter says "...I relate insights from modern memory research to these and other important manifestations of memory in our everyday lives."

With persuasive documentation, Schacter proves the existence of *nonconscious memory* and *implicit memory*, in addition to the traditional explicit memory. He explains that there are three subsystems that set up long-term memories: one set of neurons creates new connections between brain cells; a separate set retrieves related, separately stored memories such as a person's face, voice, and name; a third performs short-term jobs, such as briefly storing a phone number before it is dialed. In addition, he gives the clinical story of a patient with severe memory loss after a viral infection of the brain. She could not remember things she had just read or seen. Even strong emotions would fade within minutes. But this remarkable 40-year-old patient learned to recall. She mastered hundreds of procedures and rules to win a job as a data-entry clerk. "She has pushed to the limit," explains Schacter, citing her as an example of how *implicit* memory systems have allowed her to learn some 250 data-entry rules. Another patient (a 33-year-old man, brain injured in a car accident) is shown a drawing of an asparagus spear, and says that it is "a rose twig with thorns." Yet when asked to, he could dash off an easily recognizable drawing of asparagus. When shown a hand-drawn map of his hometown and birthplace, he could not identify it—even though he had drawn the map from memory. The accident appears to have broken a previously unknown connection between a spot in the brain that compares images coming from the eyes to a library of images in memory. This could explain the *nonconscious* memory system.

Schacter's book consists of an introduction and 10 chapters. The clinically significant chapter on posttraumatic stress disorder (PTSD) discusses the flashbacks and nightmares experienced by victims. Research suggests that long-remembered fearfulness, flashbacks, and terrifying nightmares depend on nerve connections between amygdala, the cortex, and the hippocampus. In most people, vivid memories of a traumatic experience become diluted and subdued, and die out during a period of time. But in PTSD and in other disorders such as anxiety or phobia, the brain's system for muting painful memories is somehow impaired. Images of past emotional events, deeply embedded in the brain, spring to the surface and are reimagined as if occurring here and now. The prospect of designing drugs to mimic or activate the muting mechanism is exciting and promising.

Retrieved memory has been a topic of interest in recent years. Some psycho- and hypnotherapists have been accused not of recovering forgotten memories; but of coaching patients to create fresh "memories" of abusive childhoods. Schacter treats this emotion-laden and litigious issue with utmost sensitivity and scientific rectitude. He cites several cases, including *The New Yorker*'s 1993 article on retrieved memories in the case of a Washington state deputy sheriff accused of sexually abusing his 22-year-old twin daughters. In therapy, their retrieved memories of childhood sexual abuse by their father led to conviction of the father and two co-conspirators. Recovered memory soon became a sensational hot topic for the tabloids and talk shows. This chapter is a must read for all physicians and their patients.

Another chapter ("Holes in the Past/Limited Amnesia") examines Sirhan Sirhan's assassination of Robert Kennedy. After he received the death sentence, all Sirhan could say to his

Continued on page 203

iris

UNC Students Launch a Journal for Medicine, Literature, and Visual Art

Beth Dolan Kautz, MA, Seth Collings Hawkins, Joe Scattoloni, and Nancy M. P. King, JD

> "The arts…open up a dimension of reality which is otherwise hidden, and they open up our own being for receiving this reality….The artist brings to our senses, and through them to our whole being, something of the depth of our world and of ourselves, something of the mystery of being."
>
> —*Paul Tillich,* Criterion *1964;3:39-40*

Over a year ago, a group of students and faculty at UNC-Chapel Hill's School of Medicine met together to plan a medical literary journal. Fifteen months later, at a reception for the premier issue of *iris: the UNC journal of medicine, literature & visual art*, we—the medical students who founded the journal and the journal's faculty advisors—listened to authors read their works and fully appreciated the title we chose:

Iris is a plant whose multicolored flowers symbolize hope, friendship, power, and sacrifice. A vivid interplay of emotions and images filled the room as authors read from the first issue of poems, photos, and stories about all stages of life and many varieties of health, illness, and healing.

Iris is a plant with medicinal roots. In one of several poems about unconventional healing, a poet imagined a menopausal woman "treating" herself with a trip to a football game.

Iris is the mythological messenger who transported women's souls to the Elysian fields. A father read an elegy that wrapped his stillborn daughter in mythological allusion and everyday detail; we remembered the large number of submissions from people trying to understand death and dying.

Iris is the eye's lens for viewing the world. Several authors expressed admiration for the visual art juxtaposed with their pieces; a poet who had explored the auditory fragmentation in a mentally ill person's world praised the visual fragmentation in a photograph of false limbs.

Iris is the goddess of the rainbow. Listening and speaking, sharing one another's words, overlapping and contrasting our experiences, we expanded our imaginative and empathic palettes.

What's in a Name?

We chose the name *iris* because its anatomical, mythological, medicinal, and folkloric connotations evoke the kind of complex picture of health that the journal seeks to foster. We wanted to encourage creative reflection about illness, health care, and wellness in a forum of fiction, poetry, and visual art produced not only by doctors and medical students, but by all members of the local health care community.

As the writers stood up to read their creative work, we discovered that those we thought of as nurses were also patients, patients were healers, insurance adjusters were mothers, students were teachers. The boundaries we relied on to perceive one another in the health care world dissolved. Gaps were filled, hierarchies upset; there was a sense of a community finding itself. Like the opposing sheaths of muscle that form the iris of the eye, *iris* helps shape a new space. In this article, we describe *iris*'s inception and discuss what our experience with the first issue revealed about the value of literature to the local community and to medical education.

The authors are affiliated with the University of North Carolina at Chapel Hill. Ms. Dolan Kautz is the Senior Fellow in Literature and Medicine in the Department of Social Medicine, Mr. Hawkins and Mr. Scattoloni are rising third-year medical students, and Ms. King is Associate Professor, Department of Social Medicine, UNC, CB# 7240, Wing D, Chapel Hill 27599.

Creative Reflection on Health and Illness

During their first year of medical school, Seth Collings Hawkins and Joe Scattoloni, together with third-year students Deepu Gowda and Winny Hung, sought a forum for creative reflection on health and illness. Although immersed in a largely biomedical perspective on health, illness, the body, and healing, they realized that these phenomena could be interpreted from a variety of other perspectives.

In that spirit, they joined two members of the Department of Social Medicine to launch a "medical" journal whose shared language would not be technical, but rather imaginative. We suspected that a number of people at UNC and in Chapel Hill could creatively interpret the experiences of illness, healing, and health, and that these individuals lacked only the opportunity to articulate their perspectives to one another. The nearly 100 submissions to the first issue of *iris*, and our conversations with the writers and artists who submitted their work, confirmed the existence of an intense and widespread interest in creative expression about illness and healing. A significant increase in submissions for our second issue demonstrates the powerful and continuing appeal of such a forum.

Literature and art challenge all of us to understand the humanity of health and illness in a way that science and technology alone cannot. Robert Gwyther—a UNC family physician—suggests that because doctors now use increasingly sophisticated medical technology, honing their creative, reflective, and empathic abilities enables them to keep their focus on the human interaction between caregiver and patient. Another doctor advises medical students to study the arts and humanities: "When you're a doctor, you'll often see people at their worst. If you don't know what they can imagine, what they can dream, what beauty they can create, how profoundly they can think, you won't have enough to sustain you and you'll start thinking of yourself as nothing but a plumber for humans." *iris* demonstrates that patients and family members also value the emphasis on the everyday profundities of illness experiences.

One might suspect that most of the creative submissions to a journal about health and illness would be confessional, first-person, "true" narratives of sickness or healing. Indeed, the reading and writing of literature ("poetry therapy," "drama therapy," and "bibliotherapy") have been used effectively for mental healing.[1] One of the most famous examples of such writing, Anne Sexton's confessional poetry, began as a therapeutic assignment prescribed by her psychiatrist. Writing can help individuals make sense of their illnesses, but *iris* serves as far more than "art therapy" for patients and caregivers. It moves beyond mere catharsis for each artist. The literature and graphic art in the journal mix imagination and experience to convey meaning.

The literary and visual arts can help us see the social, political, and economic implications of health and illness with new eyes. The large number of health-related articles in newspapers testifies to mounting concerns about the costs of health care, lack of access to treatment, and the influence of managed care. Most of the submissions to *iris* do not address such political and economic issues directly, but themes emerge from the collection of texts that help us think about these issues differently. For example, two short stories in the first issue of *iris* portray the emotional and financial challenges faced by those trying to care for aging parents in poor health while trying to hold their immediate families together. Several poems and short stories explore major depression and other mental illnesses; one challenges popular pharmaceutical regimens; another explores the effect of therapy on the depressed speaker's daily outlook and suicidal feelings. Many submissions look at the deaths of patients, family members and friends, and raise questions about the medicalization of dying. One poem ("Nothing," next page) articulates the silence and invisibility of pain, adding a dimension to discussions about palliative care. Revealing our current anxiety about how health care is administered, several pieces (such as "No One in Their Right Mind," next page) portray the trust, or lack of trust, between physicians and patients. Because patients are more than bodies, and more than clients, literature and art add a depth to our discussions of illness that cannot be achieved by facts alone.

Medical Education and the Humanities

Original creative works published alongside scientific studies in medical journals quietly insist that we remember the "art" of medicine amid a demanding flurry of scientific facts. To this end, poetry and essays are regularly published in *JAMA* and in the medical student honor society journal, *The Pharos*. Each cover of *JAMA* reproduces a work of visual art, and the *New England Journal of Medicine* regularly publishes original photography. In addition, at least three other medical schools publish journals devoted entirely to creative expression (*Wild Onions* at Pennsylvania State University-Hershey Medical Center; *Fetishes* at the University of Colorado Health Sciences Center; *The Body Electric* at the University of Illinois-Chicago School of Medicine). Reviews of fiction and poetry by physician-authors in journals such as the *British Journal of Medicine* reflect physicians' continuing interest in literary works.

The desire to expand beyond scientific understandings of disease is also apparent in current medical education. Approximately one-third of US medical schools, including UNC-Chapel Hill, incorporate literature into their medical curricula.[2] First-year students at UNC-CH School of Medicine take a year-long course, "Medicine and Society," taught by the faculty of the Department of Social Medicine. Students discuss social and ethical issues pertinent to medicine raised by reading academic articles from many disciplines, exploring first-person illness accounts, interviewing patients, and examining works of literature.[3] In their second year, they choose from 16 course offerings including ethics, literature, medicine and theater, the history of medicine, medical anthropology, and health policy.

Several pedagogical theories provide the rationale for using literature in medical school courses. The most obvious use is to reflect medical experience.[1] Classes based in this tradition discuss images of healers in literature, or read works by physician-authors such as William Carlos Williams, Raphael Campo, or Perri Klass.

During the past 20 years, medical education has seen the emergence of other modes of learning. The "aesthetic approach" to literature, described by Joanne Trautmann Banks,[4] teaches students to read and interpret narratives. By honing their ability to analyze discourse, to understand what is revealed in the way people tell fictional and nonfictional stories, students develop greater empathy and more complex interpretive skills. The "ethical" approach to literature focuses on the moral questions and the decision-making processes represented in narratives. Discussions about the motivation of characters explore aspects of medical ethics.[5] These two approaches have recently been combined into "narrative ethics," and opened up our ability to address issues in medical ethics by discussing them not only according to analytical principles, but also in terms of people, their voices, their relationships, and their stories.[6]

Giving Voice to a Community

Publishing a journal like *iris* requires direct interaction with the artistic community. This interaction produces a very different experience for readers and contributors than does reading or writing in a classroom setting. The literature and art in *iris* are valuable for the same reasons as is the study of literature in the classroom, but putting a journal together adds a layer of practical consideration about what we mean by community and who deserves to be heard in that community. From the garnering of funds for publication to distributing the final product, each step of producing *iris* has challenged us to consider the nature of the community we wish to bring together and serve.

As the submissions flooded in, we had to develop criteria for selecting pieces. We wanted to provoke but not to offend our then only potential readers. We looked especially for pieces that challenged received wisdom about health and illness, pieces that offered insight into worlds we do not see very often or do not take the time to think about, pieces that represented a variety of perspectives on health. We made certain that our final product would satisfy two sometimes contradictory goals: a literary journal with artistic merit in its own right, and one that reflected the diversity of experience in the university and local health care communities. This dual commitment often provoked debates about particular pieces and general principles that lasted late into the night. The process of self-definition was perhaps the most difficult element of our work, but also the most critical for producing a successful journal. In discussing our decisions, we recognized our own assumptions about illness experiences, and we learned from the authors—patients, nurses, family members, seasoned physicians—and from one another.

Like most campus-based literary magazines, *iris* is a student-run organization (with faculty and administrative advice

Nothing

Nothing moves
Like the immediacy of pain.
Gasping, grasping,
Screaming in vain:
Help me, Please! Help me!
You manage to scream
But nothing will happen
If your pain can't be seen.
When symptoms are noted
But nothing is found.
Your invisible burden's
A scream without sound.

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iris, *1997;1:6, reprinted with permission*
Ms. Barrett is a postdoctoral fellow at the Carolina Population Center, Chapel Hill

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No One in Their Right Mind

All the patients were at lunch,
you say, the parakeet was napping.
First a faint grating,
then a washboard over the PA.
Rhythmic. Louder.
LIke an approaching wasp.
I watch your ash shiver
to a taillight weaving
away from me. No one
in their right mind
tells a patient when to flip
her ashes.

You twirl your ice cubes
in a plastic tumbler of tea,
ask if what you heard
could be your bulldog
pacing at the back gate
waiting to be let in.
He might just need to know
you are still at home.
You say you recognize the sound
of trying to scratch a window
in a sheetmetal door, leaving
instead only slivers of blood.

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iris, *1997;1:42, reprinted with permission*
Ms. Grace is a writer who lives in Chapel Hill

from the Department of Social Medicine in the UNC School of Medicine). But our self-conscious work to build a diverse creative community of voices about health care, and to promote learning and reflection in and about that community, distinguishes *iris* from most medical student journals and other literature-oriented medical publications, whose voices arise predominantly from within medicine.

Supported by divisions and offices throughout the university and distributed in UNC Hospitals and across the UNC-CH campus, *iris* hopes to help build and sustain a community of readers that is as diverse as its contributors. After publishing the first issue in fall 1997, the four medical student founders selected a broader cross-section of health affairs students to continue publication. The current editorial staff includes students from the School of Medicine, the School of Dentistry, and the Division of Physical Therapy. We hope that the expansion of the staff will yield a rich and varied harvest of literature and art to be published in the journal. The new editorial staff is hard at work on the next issue of *iris*, scheduled to appear in April. We invite all members of the Chapel Hill and UNC-Chapel Hill health care community to join in our creative examination of illness, health, and healing. We hope our work encourages other health care communities to share health and illness experiences through the arts. ❑

Editor's note: iris *only accepts submissions from people with a connection to the UNC-Chapel Hill health care community: former or current patients, their families, health care providers, faculty, staff, students, volunteers, researchers, and others. Recommended length for prose is 3000 words; poems should be two pages or less.*

A limited number of copies of iris *are available.* Journal *readers can request a copy by sending a self-addressed, stamped, 8-x-10-inch envelope with $1.50 in postage to:* iris, *UNC Dept. of Social Medicine, CB# 7240, Wing D School of Medicine, Chapel Hill, NC 27599-7240, 919/966-1136.*

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In response to a 1944 polio epidemic, a camp in Hickory was converted to an emergency polio hospital, which became known as the "Miracle of Hickory" (courtesy March of Dimes. © North Carolina Museum of History).

Health and Healing Experiences in North Carolina

A Special Exhibition at the North Carolina Museum of History

From a Cherokee sweat lodge to alternative therapies and a modern-day hospital room, visitors to the Museum's just-opened exhibit will hear, see, and read the personal stories of North Carolinians as they struggle with health care issues in their lives.

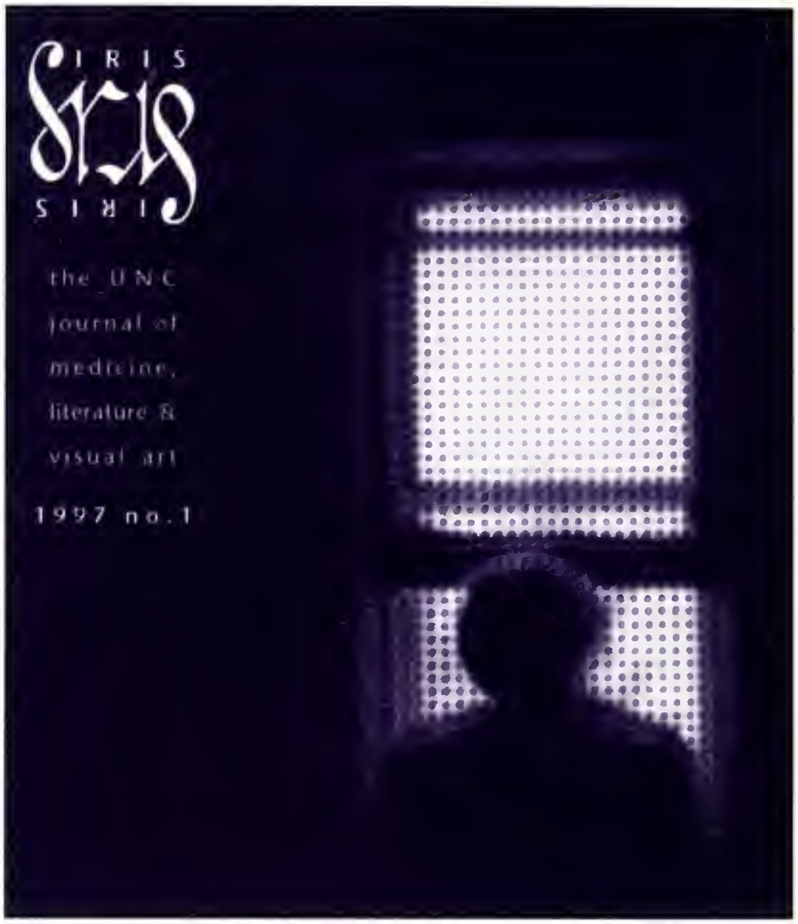
Occupying 9000 square feet of gallery space, the exhibit is the largest mounted by the Museum, which is located in downtown Raleigh across from the State Capitol. Operating hours are Tuesday-Sunday 9 am-5 pm and Sunday 12-5 pm. 919/715-0200. Free admission. Internet: http://nchistory.dcr.state.nc.us/museums

iris: a review

by William G. Porter, MD,
Charlotte physician, and
member, Journal *Editorial Board*

Hats off to *iris*! If the quality of the inaugural issue can be sustained, this new journal will become an important creative outlet and confirm its editors' belief that to understand fully the complexities of health and illness, we need something more than the biomedical model, that literature and the visual arts transmit "vital signs" that often reveal more about what ails a person than all the scans and lab tests laid end to end.

I love the way *iris* looks and feels. At 8 1/2 by 7 inches, it is too wide to fit the pocket of a white coat, but it still has "little magazine" dimensions and energy. The outside is, well, iris-colored. The front cover, at right, features a fuzzy image of a figure seen from behind, looking out a window, perhaps from a hospital room. A glaring, featureless whiteness beyond the window suggests a disorienting sadness, an inchoate blur of blinding emotion, out of which will begin a search for meaning. The poems, stories, essays, and visual art inside are attractively laid out and printed on paper of good stock.



The cover of *iris*'s inaugural issue, ©1997. Photograph by UNC-Chapel Hill undergraduate Courtney Fitzpatrick. Reprinted with permission.

As for the contents, there is much to admire. David Wohl's photograph of mannequin legs sticking up out of trash cans is at once whimsical and jarring. Even in black and white, elin o'Hara slavick's (her alternative capitalization) painting of Adam and Eve is admirably rendered.

Roger Spencer's short story, "The Salesman," gets the encounter between a doctor and a Munchausen patient just right, including the O. Henry-esque twist at the end. In "Pileated Woodpecker," Rosalind Coleman explores the disorienting anxiety a young doctor feels when she is confronted with her own illness: how distant and disinterested her doctors seem, even though she is a colleague.

As for the poetry, I confess a personal bias against the contemporary trend to enlarge its definition. Making a poem requires more than rhymes or the arrangement of words on the page. Yet the world, *iris* included, seems awash in "poetry" without other qualifications. Still, there are poems here that succeed: among them Maggi Ann Grace's "Postmastectomy," a meditation on the qualities of erotic sensation; Eve Shy's "New Grandbaby" ("Oh, how you climb/into our hearts./Your eyes reflect/mischief rising as you bid/your feet and hands/up rungs toward/stars and moon/to shower us/with/sparkle."); Greg Buchold's "la petite morte," a clever deconstruction of reproductive activity to its molecular components ("i can feel my lover pulling away/her glycoproteins sliding away from my receptors/....").

iris's editors set two goals: a final product that would have literary merit and at the same time reflect a diversity of experience in the university and local health care community. This first issue succeeds on both counts. I hope there will be many more. ❑

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Creative Writing for Health Professionals

A Workshop Co-sponsored by the North Carolina Medical Journal

As Anton Chekov and William Carlos Williams well understood, the drama and subtleties of the medical profession often create the urge to write. Moreover, by listening to patients' stories and telling our own, we pass along information that is vital to both diagnosis and healing. "The people who come to see us bring us their stories," Harvard psychiatrist Robert Coles was told by the supervisor in his first medical residency. "They hope they tell them well enough so that we understand the truth of their lives. They hope we know how to interpret their stories correctly."

Exploring the power of stories and poetry inspired by a medical setting is the focus of an upcoming workshop to be held in a retreat facility on the North Carolina coast, August 25-28. The first annual Duke University Creative Writing Workshop for Health Professionals is cosponsored by the *North Carolina Medical Journal*, the Duke University Office of Continuing Education and Summer Session, and the Duke Alumni Association. The workshop is open to physicians, nurses, and other health professionals who have an interest in creative writing.

"There appears to be a trend emerging," says Georgann Eubanks, assistant director of Continuing Education at Duke. "Last year we had a half-dozen practicing physicians who attended the 18th Annual Duke University Writers' Workshop—a craft workshop for seasoned and emerging writers. Add to this the growing number of publication outlets for medical folks who write —including *JAMA* and the literary magazine *Medi-phors*—and we realized that a writing workshop targeted specially to this group might make for a powerful learning experience. As we wrestle with managed care and the growing impersonality of the medical monolith, it is increasingly important for health professionals to share their experiences—through poetry, fiction, and memoir."

Drawing on a national audience, the Duke workshop is intended to inspire and honor creative writing by medical personnel and will feature discussions, readings, and writing exercises presented by a faculty team of notable writers and medical professionals. Among them: Dr. Bob Dick, a clinical psychologist and hypnotherapist who has worked with a number of successful professional artists, including writers, painters, sculptors, actors, and musicians, resolving issues ranging from creative block to performance anxiety; novelist Peggy Payne who has worked for 25 years as a freelancer, publishing in periodicals ranging from *Medical World News* to *Cosmopolitan* and who is also co-author of *The Healing Power of Doing Good*; Carrie Knowles, author of *Alzheimer's: The Last Childhood*, a nonfiction book about her family's struggles with her mother's Alzheimer's; Carolyn Barbier, RN, BSN, whose work has been published in *Calyx* and anthologized by the University of Iowa in *Between the Heartbeats: Poetry and Prose by Nurses*; Annette Allen, professor of Literature and director of the Center for Women Writers at Salem College in Winston-Salem, NC, where she also works with oncology patients in creative writing and journaling at the Wake Forest University/Baptist Medical Center; and Francis A. Neelon, MD, a practicing internist, member of the Duke faculty, poet, and editor of the *North Carolina Medical Journal.*

For more information on the Duke University Creative Writing Workshop for Health Professionals, e-mail geubanks@mail.duke.edu or call 919/684-6259 to receive a brochure. ❑

"Write Us a Poem" Contest

Duke University Medical Center's Cultural Services Program and The Osler Literary Roundtable are sponsoring the fourth Write Us a Poem contest. Winners will receive cash prizes for poems dealing with medical practice, nursing and health care professions, birth, dying, the experience of illness, pain, trauma, recovery, and healing. The contest is open to anyone having ties to Duke University Medical Center including present and former staff, patients and their immediate families, volunteers, students, and faculty.

Poet Robert Long of Eugene, Oregon, will judge the competition. A native North Carolinian, Long has written three books of poetry and is founding director of the North Carolina Writers' Network.

All entries must be postmarked on or before June 26. For contest guidelines, contact:

Grey Brown, Cultural Services
Box 3017, DUMC, Durham, NC 27701
phone (919) 286-3361, e-mail: brown097@mc.duke.edu

Consult

John Konefal, MD

The consult request came over the computer printer: "45 yo man s/p craniotomy for glioblastoma." Such requests have, unfortunately, become all too common. I thought of other people I had come to know who had been handed this death sentence in the prime of their lives. Patients' reactions to the news, no matter how sympathetically delivered, range from bitterness to denial. And always there is the disillusionment of realizing that the radiation "treatment" of this most-rapidly fatal of tumors prolongs life for only a few months at best.

Time in practice produces a hardening of emotions in any medical field, especially oncology. Certainly (I hope) it does not lessen doctors' ability to empathize and understand patients' feelings about their situation, but I do think the capacity to be deeply touched by things we see in the hospital becomes blunted. Maybe this is a good, or at least a protective thing, given the human tragedies that make up a large percentage of oncology practice.

After getting the consultation request, I first went to the Radiology Department. The magnetic resonance scan showed a massive tumor occupying much of one hemisphere, extending through the corpus callosum and invading the opposite frontal lobe. This patient's expected survival—with or without radiation—was even worse than the usual grim statistics I quote (when asked) about glioblastomas.

My next stop was the hospital chart rack in the nursing station of the Neurosurgical Intensive Care Unit. As I soon discovered, this man was no "usual" glioblastoma patient. He had been paralyzed below the fourth thoracic vertebra since the age of 15, supposedly because of a transverse myelitis of viral origin. Despite his paraplegia, he had led an active life. He was married and had three children. The list of his medical problems included nearly all the neurogenic and infectious complications of paraplegia. He had chronically infected decubitus ulcers. He had undergone an above-the-knee amputation to control an osteomyelitis. He had an active infection in a large, deep open wound of the opposite hip. He had undergone cystectomy and had an ileal loop conduit. For 20 years, his wife had assisted his bowel movements by manual rectal stimulation or disimpaction.

I walked through the door of his room to meet the person behind this sad story. His head was raised, half of it shaved to expose a fresh craniotomy incision. My subjective impression that he was in respiratory distress was objectively confirmed by low pulse oximetry readings. The two limbs that had carried him through life were now rendered useless by this latest addition to his problem list: he could barely lift one hemiparetic arm against gravity and the other showed spastic intention tremors. But even through a facial droop I could see the smile generated by his one functioning facial nerve. Our ensuing discussion established that his mental acuity was intact.

His wife stood beside the bed and held his hand, worry etched on her face. His daughter stood proudly and protectively next to her father on the other side of the bed. When the patient spoke, his wife could understand his dysarthric speech, but I could not. She laughed heartily at what he said, and I thought I saw in their interaction the answer to my unspoken question of why a woman would choose to share her life with a severely ill paraplegic.

The subjects that had to be discussed were discussed. We all came to the same conclusion: the limited benefits of radiation would not be worth the physical hardship the treatment would place on the patient. They asked specific questions about prognosis, and accepted the answers serenely. At the end of the discussion, the half-smile was still on the patient's face, and his wife and daughter each held a hand. They had been through many difficult situations together. This was just another that they would get through—together.

I wrote a perfunctory note in the hospital chart, thinking of how cruel fate had been to this brave soul. He had been dealt a terrible hand in life but played it remarkably well, only to be hit by a final insurmountable problem. My thoughts were interrupted by the patient's wife. She came out to ask a few more questions. I offered my sympathy, and expressed admiration at her devotion and fortitude despite all the adversities she had faced.

She smiled sweetly and said softly, "It's easy when you love someone." ❑

Dr. Konefal is a Radiation Oncologist with NorthEast Medical Center, 920 Church St. N, Concord 28025.

CME Calendar

May 1-3
Mindfulness-Based Stress Reduction in Mind/Body Medicine
Place: Embassy Suites Hotel, Cary
Fee: $245
Info: Hospital Education, Box 3833, Duke University Medical Center, Durham 27710, 919/684-4293

May 6
National Nurses Day: 2nd Annual Open House
Place: NC Nurses Assn. headquarters, 103 Enterprise St., Raleigh (near Cameron Village)
Info: 9 a.m. - 4 p.m., 800/626-2153, *e-mail:* ncnurses@aol.com, *Internet:* http://www.nursingworld.org/snas/nc/index/htm

May 13-15
Carolinas HealthCare System Spring Symposium
Place: Charlotte Convention Center
Credit: up to 24 hours Category 1, AMA
Info: Mary Anne Cox or Brenda Armes, CHS/Charlotte AHEC Office of CME, 1366 E. Morehead St., Charlotte 28204, 800/562-7314, 704/355-8631, *e-mail:* www.symposium@carolinas.org, *Internet:* www.carolinas.org/symposium/

May 15
American Medical Writers Association Workshops: Preparing the Technical Section of an NDA, Bibliographic Resources for Medical Communicators, Tables and Graphs, Launching a Freelance Writing Career
Place: Friday Center, UNC-Chapel Hill
Fee: $95 for 1 workshop, $180 for 2 (includes lunch)
Info: Carol Gatlin, 919/933-8307

May 22
2nd Annual Coastal HIV/AIDS Conference
Place: Hilton Hotel, Wilmington
Credit: 6 hours Category 1, AMA; 7.2 hours ANA/NCNA; 6 hours NCSAPCB (substance abuse-specific)
Fee: $75
Info: sponsored by UNC School of Medicine, hosted by Coastal AHEC and New Hanover Regional Medical Center. Contact: Beth Mixon, Coastal AHEC, P.O. Box 9025, Wilmington 28402-9025, or call Susan O'Brien, 910/815-5877

May 23
Race for Sound Beginnings 5K & 1 mile
Place: Research Triangle Park
Fee: $7, late fee $10
Info: Carolina Ear Research Institute, 3404 Wake Forest Road, Suite 301, Raleigh 27609, 919/876-4327 or 919/850-4327, *e-mail:* christa@health-web.com or mmiller@carolinaear.com

June 2-19
10th Annual International Spine Workshop
Place: Uniformed Services University of the Health Sciences, Bethesda, MD
Info: June 2-5: cervical; June 7-9: peripheral nerve; June 11-13: minimally invasive/endoscopy; and June 15-19: thoraco-lumbar. Contact 757/455-5812 or *Internet:* http://www.spinalresearch.org

June 4-7
Comprehensive Internal Medicine Board Review Course
Place: Winston-Salem
Credit: 29 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

June 9-13
7th Annual Advanced Cardiovascular Interventions Symposium
Place: Westin Resort, Hilton Head, SC
Credit: up to 18 hours Category 1, AMA
Fee: $795
Info: Mary Anne Cox, CHS/Charlotte AHEC Office of CME, 1366 E. Morehead St., Charlotte 28204, 800/874-2417

June 11-15
AMA Organized Medical Staff Section Assembly Meeting
Place: Sheraton Chicago Hotel
Credit: 8.5 hours Category 1, AMA
Info: AMA-OMSS, 800/621-8335

June 19
UNC Ophthalmology Residents' Day
Info: Christine C. Cotton, UNC Dept. of Ophthalmology, CB# 7040, 617 Burnett-Womack Bldg., Chapel Hill 27599

June 27
Silent Reflux and Diseases of the Larynx
Place: New York, NY
Credit: 6 hours Category 1, AMA
Info: course also being offered October 30 in New Orleans, LA; and December 4 in Chicago, IL; contact: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

July 3-5
28th Annual NCMS Sports Medicine Symposium
Place: Sheraton Atlantic Beach Resort, Atlantic Beach
Fee: $115 NCMS members, $155 nonmembers, $45 residents, $55 allied health professionals, free for students

Credit: 7.5 hours Category 1, AMA; .75 CEUs for athletic trainers
Info: jointly sponsored by Wake Forest University School of Medicine; contact Dana Hammermeister, NCMS, 800/722-1350 or 919/833-3836, fax: 919/833-2023, *Internet:* http://www.ncmedsoc.org

July 17-19
Heart Failure Management
Place: Ritz Carlton, Amelia Island, FL
Info: sponsored by Div. of Cardiology, UNC School of Medicine, fax: 919/962-1664, *e-mail:* jane_radford@med.unc.edu

July 31-August 3
Duke University Technical Writers' Workshop
Place: Trinity Conference Center, Salter Path next to Emerald Isle
Fee: $595 single, $495 double (includes meals); $400 commuter (meals, no lodging)
Info: focus is on writing excellence across technical disciplines, including medicine; for brochure, call 919/684-6259

August 2-7
Ultrapath IX: Society for Ultrastructural Pathology
Place: Grove Park Inn Resort, Asheville
Credit: 28.5 hours Category 1, AMA
Fee: $495
Info: John Shelburne, MD, Box 3712, DUMC, Durham 27710, 919/286-6925, *e-mail:* shelburne.john@forum.va.gov, *Internet:* http://sup.ultrakohl.com/ultrapat.htm

August 3-7
27th Emery Miller Medical Symposium
Place: Myrtle Beach, SC
Credit: 20 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

August 25-28
Creative Writing Workshop for Health Professionals
Place: Trinity Center, Bogue Banks, NC
Fee: $695 single, $595 double (includes meals); $450 commuter (meals, no lodging)
Info: Co-sponsored by *North Carolina Medical Journal*; for brochure, call 919/684-6259

September 18-19
Geriatrics Symposium
Place: Winston-Salem
Credit: 9 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

September 25-27
Comprehensive Gynecology: Clinical Update for Practicing Physicians
Place: Crowne Plaza Manhattan, New York, NY
Credit: 13.5 Category 1, AMA
Fee: $495
Info: Center for Bio-Medical Comm., Inc., 201/385-8080 ext. 26, *e-mail:* jrosenberg@cbcbiomed.com

October 2
Rheumatology Update for the Primary Care Physician
Place: Winston-Salem
Credit: 6 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

October 2-4
5th Annual Joint Meeting: NC and SC Chapters, American College of Cardiology
Place: Westin Hotel, Hilton Head, SC
Info: NC ACC, 4101 Lake Boone Trail, Suite 201, Raleigh 27607, 919/787-4916, *e-mail:* MADilday@compuserve.com

October 9-11
"When Bad Things Happen to Good Doctors": How to Survive in a Hostile Environment Without Selling Out Your Ethics or Patients
Place: Crabtree Valley Marriott, Raleigh
Info: Association of American Physicians and Surgeons, 800/635-1196

October 16-17
5th Fall Symposium on Atherosclerosis
Place: Blowing Rock
Credit: 6 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

October 25-28
Advances in Physiology and Pharmacology
Place: White Sulphur Springs, WV
Credit: 17 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

October 28-31
American Medical Writers Assn. Annual Conference: Biomedical Communication in a Changing World
Place: Vancouver, British Columbia
Info: AMWA, 9650 Rockville Pike, Bethesda, MD 20814, 301/493-0003, fax: 301/493-6384, *e-mail:* amwa@amwa.org, *Internet:* http://www.amwa.org

October 30-November 1
19th Mountain Medical Meeting
Place: Asheville
Credit: 12 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

November 12-15
NCMS Annual Meeting
Place: Sheraton Imperial Hotel, RTP
Info: Contact Dana Hammermeister, NCMS, 800/722-1350 or 919/833-3836, fax: 919/833-2023 ❑

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Call 919/286-6410 for information about Classified rates. Next deadline (July/August issue) is June 10.

Carolina Physicians' Bookshelf

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mother was " Mom. I'm sorry, I don't remember anything." Unfortunately, we get no clear explanation of how to differentiate between fake amnesia or intoxication from legitimate limited amnesia. This is a challenge that deserves more extensive research.

Then there is the problem of dissociative disorder, borderline personality disorder, and myriad of other psychological conditions that use amnesia as a defense. In one sense, we are all victims of mass media hysteria. A century ago in private salons of Charcot's Salpetriere, women acted out their hysteria in ritualistic dances and hoped to be cured by hypnosis. Charcot's rituals are now subserved by television and talk shows. Recently, a psychiatrist was arrested for treating a woman with 56 personalities and billing each separately! Individuals and politicians investigated by ethics committees often use the all-too-familiar defense: "I don't recall, Mr. or Madam Chairman." The field of the brain and memory is not as pristine and pure as one might wish.

I regret that this elegant and magnificent volume has a major flaw. The genetic, neurotransmitter, neurochemical, and neurohormonal underpinnings of memory receive very little attention. If there is any hope for helping patients with dementia, cortical atrophy, and Alzheimer's disease, it certainly will come through better understanding of the above elements.

Fortunately, an exhaustive bibliography connects readers to a comprehensive network of references. Thanks to the Internet and World Wide Web, I was able to access and download many of them. What a feast! ☐

Aphorisms of the Month

Marvin Rozear, MD, Guest Editor

"Sickness and Science"

A lot of people get sick and, after a while, they just get well. —*Eugene A. Stead, Jr., MD*

I have nothing against being somewhat a quack. I always have been a quack. The problem is that medicine doesn't lend itself to being overly scientific.
—*Eugene A. Stead, Jr., MD*

The modern doctor is able to tell when scientific medicine can be useful.... If science...is unable to benefit the patient, we should not deny him access to other healers operating on a mystical base.... The best way to handle the problem would be to have a department store for sick patients. At the door would be the scientific doctor. If he understands the problem and can bring science to bear on it, he would treat the patient. If he did not understand the problem but knew that science had nothing to offer, he would allow the patient to enter the store. Healers of all types would display their wares, and the patient could choose the health artist who most appealed to him.
—*Eugene A. Stead, Jr., MD*

You're gonna serve somebody. —*Bob Dylan*

For this is the great error of our day, that physicians separate the soul from the body. —*Plato*

The art of medicine consists of amusing the patient while Nature cures the disease. —*Voltaire*

A certain portion of the human race has a taste for being diddled. —*Thomas Hood*

There's a sucker born every minute.
—*Phineas T. Barnum*

It is morally wrong to allow suckers to keep their money. —*"Canada Bill" Jones*

Dr. Rozear is this column's guest editor. Section editor is Dr. Dan Sexton, Box 3605, DUMC, Durham, NC 27710. e-mail: sexto002@mc.duke.edu

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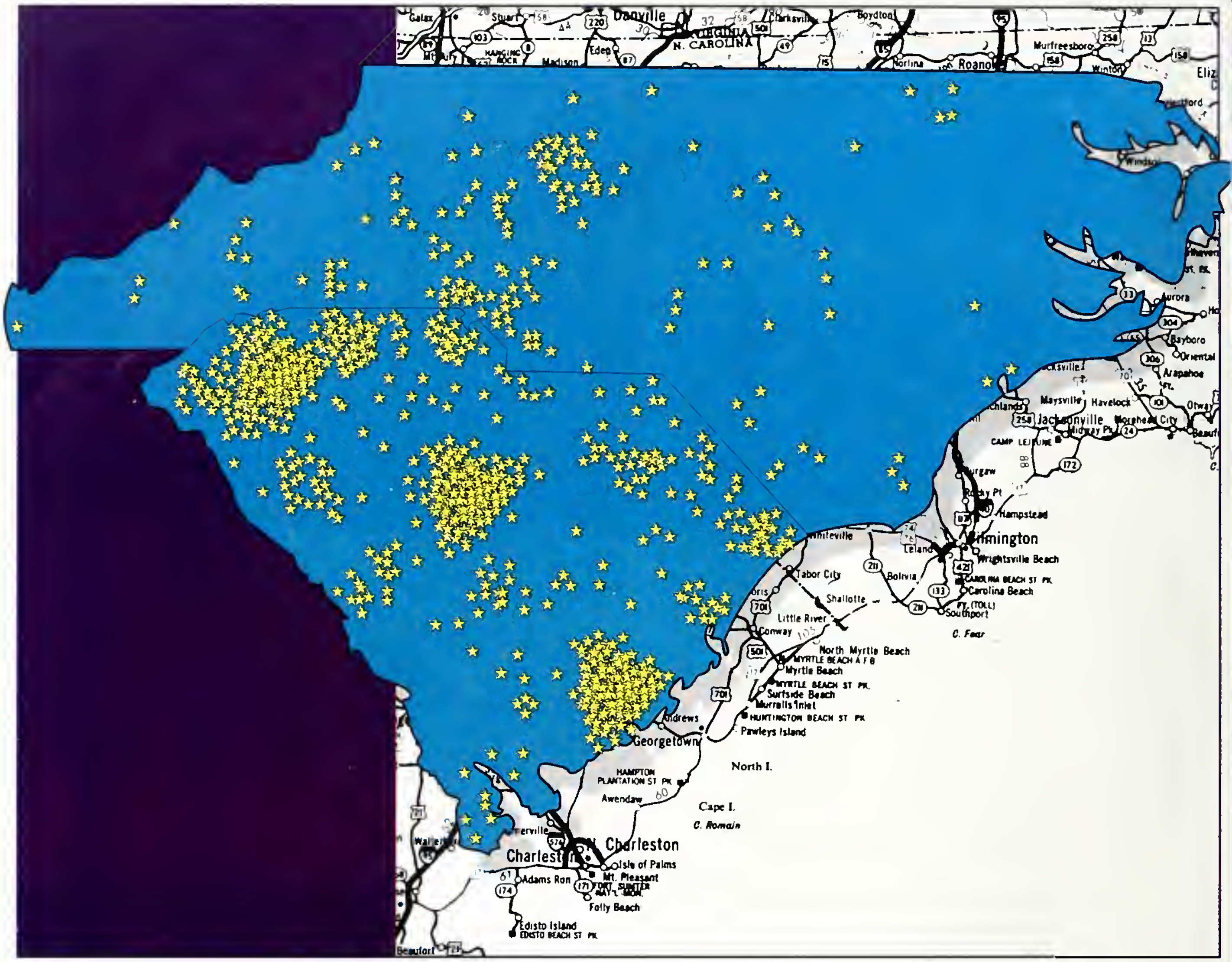

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It could clarify how critical "one-call" support can be in helping offices stay productive—how telephone support staff, software and hardware engineers, technicians, trainers, and a fleet of service vans can provide support unmatched in the industry.

It might demonstrate how on-going research and development brought innovations like the first integrated, direct electronic claims transmission in a practice management system.

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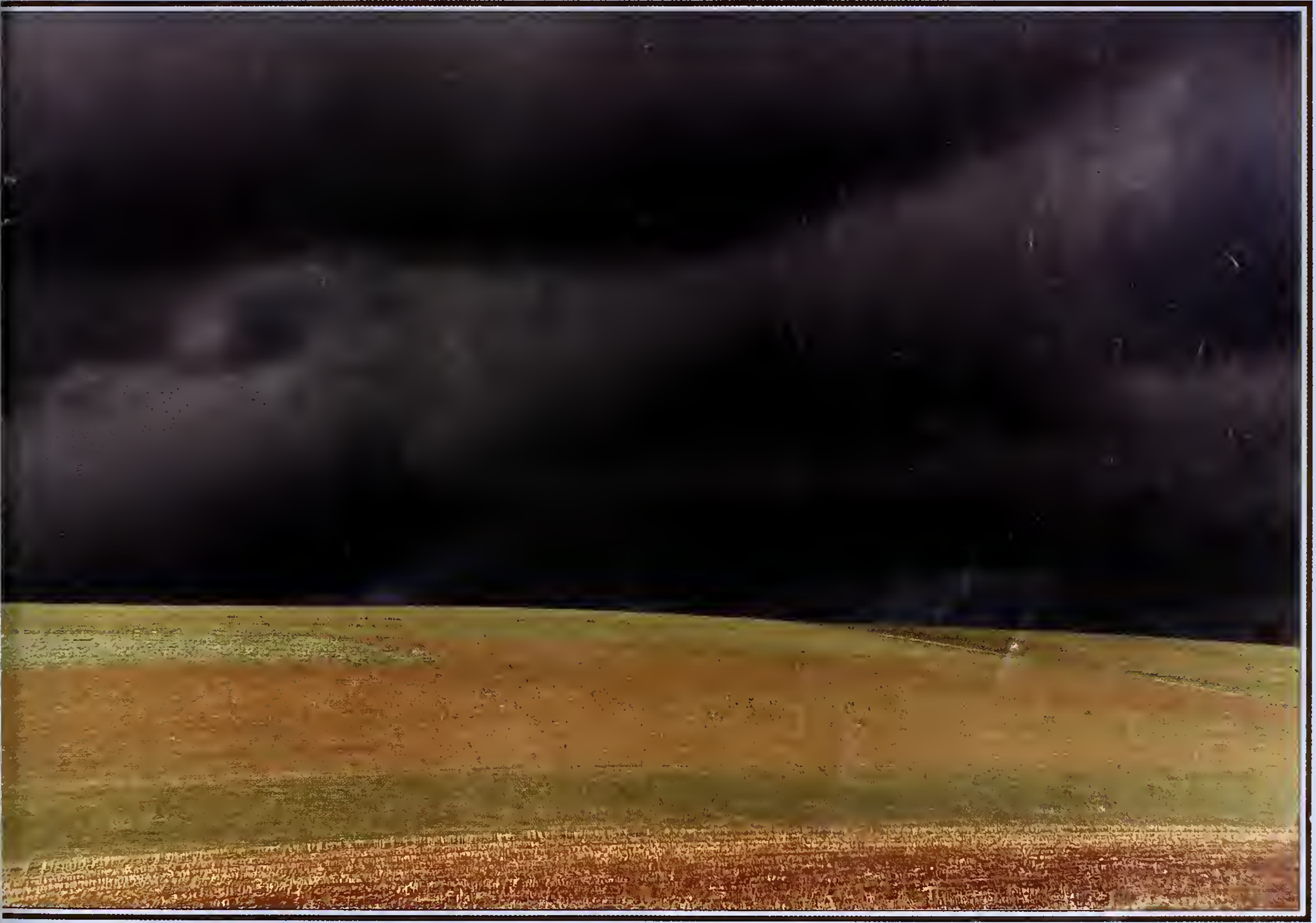
North Carolina Medical Journal

For Doctors and Their Patients



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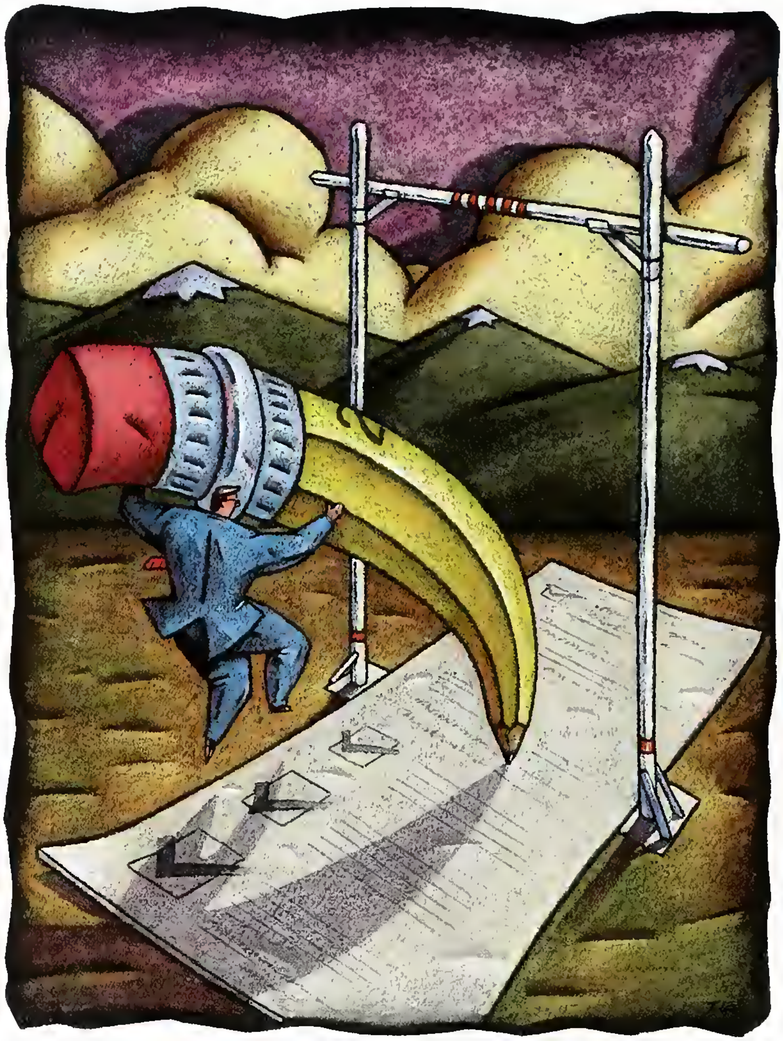

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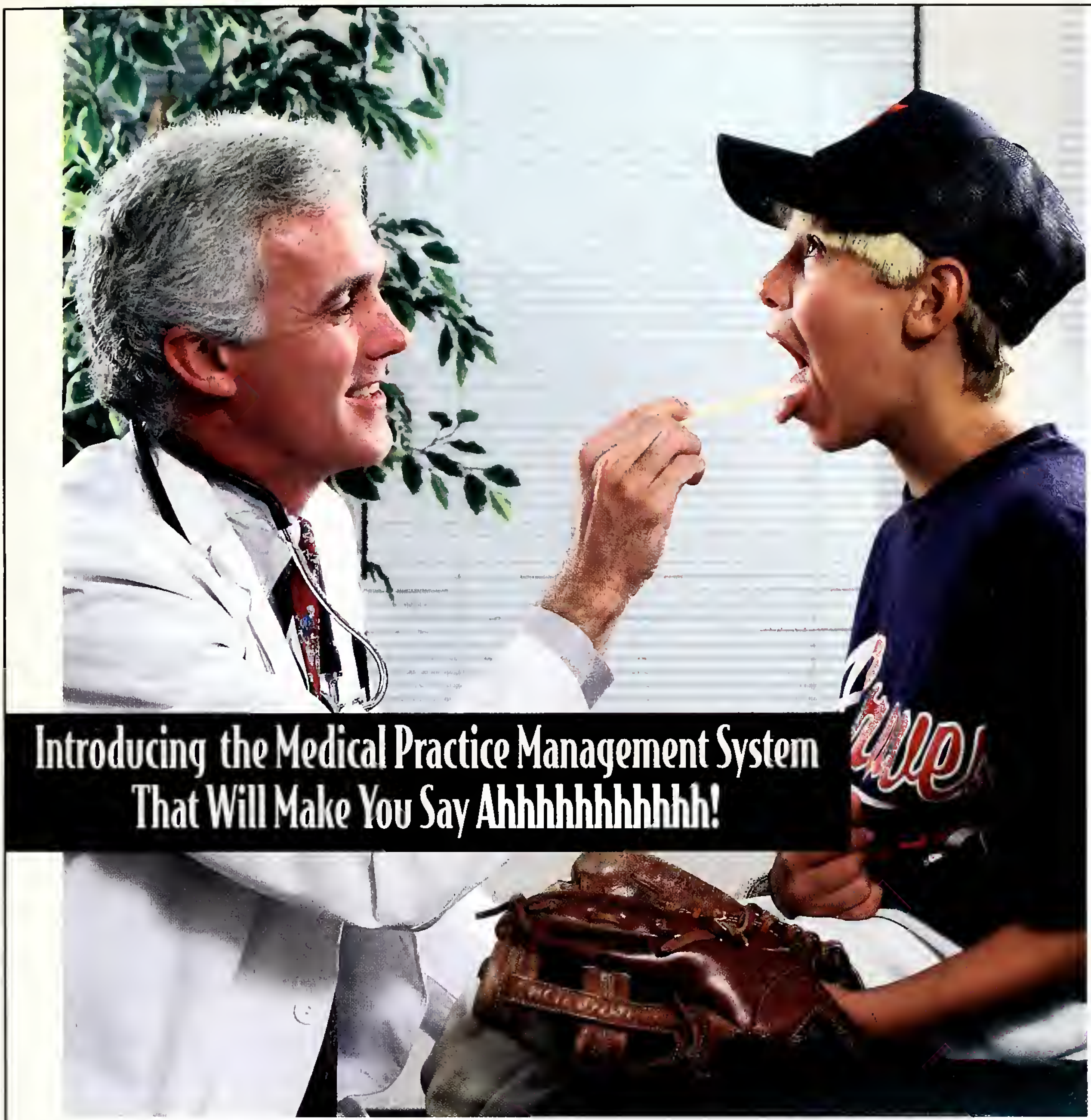
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For Doctors and their Patients

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North Carolina Medical Journal

FOR DOCTORS AND THEIR PATIENTS

July/August 1998, Volume 59, Number 4

Cover: This issue's cover photograph was taken in Switzerland by Dr. Mark Swaim. It is from a selection previously exhibited at Duke Medical Center in Durham. About the photo, Dr. Swaim remarks: "It was shot on the Swiss side of the Bodensée in January 1991. Director Ingmar Bergman once got frustrated on a shoot there because of persistent heavy clouds. He tapped a cane smartly on the ground 3 times, and said, 'I'd sell my soul for some bright sun.' Within seconds, the clouds parted, and the film crew had a few moments of bright sky. I didn't swap my soul or anything, but I suddenly had ebullient sun in the foreground and clouds without relent in the background. Odd." Dr. Swaim's essay appears on page 256.

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Instructions for Authors

The *North Carolina Medical Journal* is a medium for communication with and by members of the medical community of this state. The *Journal* publishes six times a year: in January, March, May, July, September, and November.

The *Journal* will consider for publication articles relating to and illuminating medical science, practice, and history; editorials and opinion pieces; letters; personal accounts; poetry and whimsical musings; and photographs and drawings. Papers that relate to the present, past, or future practice of the health professions in North Carolina are especially pertinent, but manuscripts reflecting other perspectives or topics are welcomed. Prospective authors should feel free to discuss potential articles with the editors.

Manuscript Preparation

Prepare papers according to the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (N Engl J Med 1991;324:424-8) with the following exceptions: 1) no abstract is needed; 2) no running title is needed; and 3) report measurements in metric units; use of the International System of Units (SI) is optional.

Submit a cover letter and a 3 1/2-inch computer disk that contains the text written in MS DOS- or Macintosh-compatible format. *Also enclose three hard copies of the text for review purposes.* Double space text with one-inch margins. *Please do not "format" the text* (e.g. no variations in type size, no bold face, no italics, no embedded endnotes).

Submit photographic illustrations, in duplicate, as high-quality color 35mm slides or 5-by-7 or 8-by-10-inch glossy prints, or as black-and-white glossy prints (5-by-7 or 8-by-10-inch). Label all illustrations with author's name, number them sequentially according to their position in the text, and indicate the orientation of the images, if necessary. *Do not write directly on the backs of prints.* This can damage them. If figures require printing in four-color process, we may ask the author to pay printing fees or a portion thereof.

Submit tables, charts, and graphs as hard copy *and* include copies on disk, in their original format *and translated as TIFF, PICT, or EPS documents.* Type all figure legends separately. Type and double-space all tables, one to a single sheet of paper. Tables must have titles and consecutive Arabic numbers.

Keep references to a minimum (preferably no more than 15), retaining those that document important points. The "Uniform Requirements" cited above contain reference format. We customarily list the first three authors for "et al"-type references. Authors are responsible for the accuracy and pertinence of all citations.

Avoid abbreviations entirely if possible; keep them to a minimum if not. When used, completely define abbreviations at the first point of usage in the text.

Manuscript Review and Editing

A medically qualified editor reads all manuscripts and, in most instances, sends them out for further review by one or more other members of the North Carolina Medical Society. *Authors' cover letters must include a line that states that their submitted manuscripts are not under consideration for publication elsewhere. It is not the Journal's policy to reprint previously published articles.* Decisions to publish or not are made by the editors, advised by the peer reviewers.

We encourage a relatively informal writing style since we believe this improves communication. Imagine yourself talking with your unseen audience—as long as this doesn't lead you to scientific or linguistic inaccuracy. Be brief, clear, simple, and precise.

We edit accepted manuscripts for clarity, style, and conciseness. Except for letters, authors receive a copy of the edited manuscript for their review and approval before publication. Manuscripts not accepted will not be returned.

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Submissions

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Letters to the Editor

Feeding Tube Placement Should Be Rare

To the Editor:

A very interesting topic is not addressed in the article "Colocutaneous Fistula: A Rare Complication of Percutaneous Gastrostomy" (NC Med J 1998;59:80-2) by Drs. Smith and Clancy. The question is when, *if ever*, should gastric feeding tubes be placed. The two cases discussed in the article seem to me good examples of when tubes should not have been placed. In these cases, they seemed to function only to deprive the patients of natural, easy deaths.

It's no wonder that the medical profession is losing its moral and ethical authority. We can't cope with simple ethical problems like this.

I believe that placement of gastrostomy tubes is appropriate only in very few instances, such as esophageal stricture in a competent adult. They would almost never be appropriate for someone in a nursing home.

I think the first case discussion is also a good example of wasting huge amounts of money in a futile effort to prolong life with little quality left. If someone were to place a gastrostomy tube in me under such circumstances, they could count on me coming back to haunt them.

Martha J. Brewer, MD
Western Carolina WomenCare
Obstetrics & Gynecology
186 Medical Park Loop, Suite 503
Sylva, NC 28779

Dr. Clancy responds:

Gastric feeding tubes provide short- and long-term enteral nutrition in patients who are unable to eat normally, and they provide comfortable access to the gastrointestinal tract in patients who require decompression. Considering the rapidly growing geriatric population, Dr. Brewer's question has broad application and demands that we carefully separate the procedure from the patient. A patient's best interests should dictate the use of a feeding tube. However, not all patients or families agree on what constitutes "best interest," and they might not agree with their physician's wisdom.

Many patients in whom percutaneous gastrostomy (PEG) is performed have chronic, debilitating diseases, some of which may be terminal. Distinguishing between prolonging the dying process and extending meaningful life may be difficult and controversial. Presently, there is a proliferation of nursing homes for patients no longer able to communicate with their environment. The feeding tube is ubiquitous and, in some instances, a prerequisite for admission. Physicians, patients, and families must communicate clearly what they feel represents "quality of life" when confronting these issues. Whether or not PEG is an overly performed procedure warrants a well-designed study to determine an answer. The ethical issues, however, are difficult to quantitate. Physicians who request or perform PEG must evaluate the individual patient's circumstance in order to answer the question of when, or if, a feeding tube should be placed.

Thomas V. Clancy, MD
General Surgery/Trauma
Coastal Area Health Education Center
P.O. Box 9025
Wilmington, NC 28402-9025

Managed Care Involves Physician Ethics

To the Editor:

I applaud Dr. Neelon's decision to publish the statement of the NC Medical Society's Bioethics Committee regarding the role of the medical profession in a managed care environment (NC Med J 1998;59:96-100). He correctly paraphrases Socrates when he states that "the unexamined practice is not worth practicing." I applaud his efforts for going beyond the prescribed limits of political discussion as set by the medical politician leaders of organized medicine.

I am editor of *Medical Sentinel*, the journal of the Association of American Physicians and Surgeons. The AAPS recently was awarded its legal fees for a lawsuit filed in 1993 against the illegal, behind-closed doors secrecy of the Clinton health care plan. And, the AAPS just filed a lawsuit challenging the new Evaluation and Management (E&M) guidelines on both statutory and constitutional grounds.

I urge physicians to write for information on the AAPS at 1601 N. Tucson Blvd., Suite 9, Tucson, AZ 85716.

Miguel A. Faria, Jr., MD, Editor
Medical Sentinel
Hacienda Publishing, Inc.,
P.O. Box 13648
Macon, GA 31208

The Ethics of Health Care

To the Editor:

The resolution of the Bioethics Committee (NC Med J 1998;59:96-7) is inaccurate and unethical.

1. The statement that most problems in medical care delivery currently origi-

nate from insurance is simplistic and inaccurate. The implication that care was better delivered prior to the advent of health insurance neglects the fact that health care was delivered even more inequitably then than it is now.

2. The need to "exchange something of mutually agreed upon value" would return us to a system in which those without means go without health care. In any case, this system already exists for people with means. Insurance companies do not stop those able to afford it from paying for their own MRIs or for consultations with physicians of their choice. They do provide some protection for those who cannot afford needed health care.
3. A system of catastrophic health insurance would be unwise from both health and economic standpoints. If preventive health care is not funded, many people would defer getting medical care until they had developed serious medical problems. Why should we pay for stroke care instead of paying for blood pressure screening and treatment of hypertension? It would be better for the health of our population to invest in interventions that keep people healthier rather than to wait until they develop devastating illnesses. Catastrophic health insurance would also be extremely inflationary as it would fund expensive, high-tech procedures.
4. Although the principle that physicians have an obligation to provide care to the poor appears to be noble, charity care has never met the needs of those who could not afford health care. I agree with the Bioethics Committee that the patients should have more control over their health care decisions and that much damage has been done by the power that third parties exert over health care. But I believe that the Bioethics Committee resolution would worsen that situation.

The Bioethics Committee and the NCMS should work to develop a medical system that provides access to health care for all, treats our citizens equitably, promotes the sanctity of the doctor-patient relationship, and emphasizes health, prevention of illness, and the detection of early treatable disease rather than management of catastrophic illness.

Jessica Schorr Saxe, MD
saxe@charlotte.infi.net

Dr. Weaver responds:

Dr. Saxe's criticism of the Bioethics Committee's statement is an example of how shortsightedness and a superficial examination of the issues has led Medicine into its current tailspin.

To state that the need to "exchange something of mutually agreed upon value" would mean "that those without means go without health care" denies the concept that physicians have an obligation to provide care to the poor, as the Ethics Committee statement proclaims. It *is* our professional obligation.

Does Dr. Saxe actually believe that "if preventive health care is not funded, many people would defer getting medical care"? Where is the proof of this? What a paternalistic way to view patients. It is this "people can't take care of themselves" attitude that has contributed to the development of the "Medicare mentality"—and look where that has gotten us.

Contrary to what Dr. Saxe states, Medicare patients do not have the right to pay a physician privately for services they want. HCFA edicts and federal laws prevent "private contracting." Medicare, you see, wants everyone to be the same—except for the bureaucrats who know somebody and can find a way around this predicament. This has forced everyone to accept the same "low-cost" rationed government medicine. This is an abomination in a country that promotes itself as the "land of the free."

Dr. Saxe and others have bought the concept that "preventive care" will save the health care system. The hidden implication here is that with "preventive care" we will never get sick! But we will all get sick some day, I don't care how much prevention we employ. Managed care sells "preventive care" because it doesn't cost much of their premium dollar—"lose weight, eat right, don't smoke, and get exercise!" What does that cost?

Dr. Saxe and I differ in our reading of history and what it says about our future. A system that allows and respects individual choice, encourages individual responsibility, and nurtures individual liberty will flourish. That's the essence of our Declaration of Independence and our Constitution. It's the fundamental philosophy that I support. But the system that Dr. Saxe proposes—Medicare is an example—can only sustain itself by intimidation, suppression, coercion, and tyranny. A system that controls people's decisions while it demeans individual values is, in its applied sense, called socialism. This is where her ideas will lead American Medicine: to the junk heap of history.

I invite *Journal* readers who want to understand these ideas more clearly to attend the annual meeting of the Association of American Physicians and Surgeons (AAPS), October 9-11, at the Raleigh Marriott hotel. For information, call 800/635-1196.

James P. Weaver, MD
Associate Editor, NCMJ
Member, NCMS Ethics Committee
President-Elect, AAPS
4125 Ben Franklin Blvd., Suite 100
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Law Won't Curb Teen Smoking

To the Editor:

The March/April article, "How Does North Carolina Law Enforcement Limit Youth Access to Tobacco Products: A Study of Officers' Attitudes and Behaviors" (NC Med J 1998;59:90-4) by Goldstein et al, was timely, appropriate, and important.

Certainly the authors' intent was to deal with the issue of the role of law enforcement in limiting access to tobacco. However, I was disappointed that they did not address the role of parents, family, and the educational system in confronting this important societal problem.

Continued on page 212

They're Counting On You...

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Letters to the Editor

continued from page 210

Clearly, the most effective way to decrease smoking in our young people is through educational activity both within the home and within our school system. It will not be by enforcement of North Carolina's youth access to tobacco law (GS 14-313), although this may be an adjunct.

Eugene M. Bozymski, MD
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Chief of Endoscopy
Digestive Diseases and Nutrition,
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Chapel Hill, NC 27599-7080

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Educating the Public About Ovarian Cancer

To the Editor:

The Ovarian Cancer Research Fund, Inc., (OCRF) would like permission to make 500 reprints of the article "Oral Contraceptive Pills: Prevention of Ovarian Cancer and Other Benefits," by Drs. Andrew Berchuck and Joellen Schildkraut (NC Med J 1997;58:404-7).

OCRF is a not-for-profit organization devoted to supporting early diagnostic and treatment programs and research toward ultimately eliminating this disease.

In response to inquiries to our toll-free number, we are putting together a packet that includes some general information about ovarian cancer and its treatment, a resource list, and some details about our organization. We would like to include Drs. Berchuck and Schildkraut's article in this packet. We believe that ovarian cancer patients, women concerned about their own risk factors for the disease, and concerned family members will find the article useful and informative.

Jamie L. Boris, Executive Director
Ovarian Cancer Research Fund, Inc.
One Pennsylvania Plaza, Suite 4800
New York, NY 10119-1065

From the Editor:

We were pleased that the OCRF found this article worthy of dissemination. The *Journal* and Dr. Berchuck were happy to grant this organization permission to reprint it.

Remembering UNC Medical School Alumnus

To the Editor:

My dear friend, Augustus S. Rose, 59, died March 27, in Long Beach, CA, after a long battle with multiple sclerosis. Gus received his medical degree at UNC-Chapel Hill in 1964. He served his residency in Internal Medicine at UCLA and practiced gastroenterology in Long Beach until 1983.

Gus had many friends in North Carolina. I encourage anyone who remembers, and was inspired by, his strength of character, integrity, and kindness to make a contribution in his memory to the Augustus S. Rose Multiple Sclerosis Research Fund, UCLA Department of Neurology, 710 Westwood Plaza, Los Angeles, CA 90095-1769.

Takey Crist, MD
Director, Crist Clinic for Women
200 Memorial Drive
Jacksonville, NC 28546

Biography of Dr. Berryhill

To the Editor:

Drs. Bill Blythe, Floyd Denny, and Bill McLendon of the University of North Carolina are preparing a biography of Dean Reece Berryhill along with a history of the foundation of the academic medical center at Chapel Hill. We anticipate completing this project before the 50th anniversary celebration, in 2002, of the opening of the North Carolina Memorial Hospital and the beginning of clinical education for medical students in Chapel Hill in 1952.

We would appreciate hearing from *Journal* readers who would be willing to share reminiscences, anecdotes, correspondence, or photographs of Dr. Berryhill. Please contact one of us: Dr. Bill Blythe, 919/942-6500, 114 Hillcrest Circle, Chapel Hill, NC 27514; Dr. Floyd Denny, 919/962-1136, 9210 Dodsons Crossroads, Chapel Hill, NC 27516-7681; or Dr. Bill McLendon, 919/942-5227, 902 Woodbine Drive, Chapel Hill, NC 27514-4423.

Bill Blythe, MD,
Chair, *Journal* Editorial Board
114 Hillcrest Circle
Chapel Hill, NC 27514

Guidelines for Letters:

We encourage and welcome reader feedback. Type and double space all text. Keep length to under 500 words. We welcome longer letters, and may publish them as commentaries. Send these letters accompanied by a computer diskette, written in either MS DOS- or Macintosh-compatible format. Disks will not be returned unless requested. We reserve the right to edit and abridge all copy.

Send to: *North Carolina Medical Journal*, Box 3910, DUMC, Durham, NC 27710, fax: 919/286-9219. You may also submit letters via e-mail (yohn0001@mc. duke. edu), or through the submission form on our website (http://www.ncmedicaljournal.com).

Health Watch

Should It Stay, or Should It Go?

by Edward C. Halperin, Deputy Editor, and Professor and Chair, Duke Department of Radiation Oncology

On the title page of the *North Carolina Medical Journal*, tucked just below our masthead, is the subheading "For Doctors and Their Patients." For those of us on the editorial staff, those five words have always had a special meaning. We've tried, in the pages of the *Journal*, to provide timely information to the practitioners of medicine in North Carolina as well as useful health information for the general public. It's a formidable goal, and we've tried our best to meet it.

Our most visible effort to reach patients has been our center section, Health Watch. Our readers have, over the years, become accustomed to Health Watch's special appearance: It's printed on heftier paper and designed to be pulled out and left in your waiting room if you wish. Over the years, Health Watch has addressed dozens of subjects of use to North Carolinians concerned about their health. Topics have included hearing preservation, self-examination of the skin and breasts, and safe sexual practices, to name a few.

Health Watch has, at times, been difficult to fill. Physicians who choose to write for medical journals, including ours, almost always submit articles for peer review directed toward their fellow practitioners. We almost never have a submission, tossed through the transom of the *Journal's* door, specifically for Health Watch—even with a fair bit of arm-twisting of our contributors. Fortunately, most Health Watch submissions have been solicited from physicians by the Communications Department of the North Carolina Medical Society. Alas, this source may be drying up also.

And so, our readers, we turn to you. Have you found Health Watch useful? Do you share it with your patients? Should it be continued as a regular feature of the *Journal*? We'd especially like to hear from those of our readers who are not physicians. What do you think of our center section? Please write to us and let us know your thoughts. After all, it's your *Journal*!

Send your comments to:
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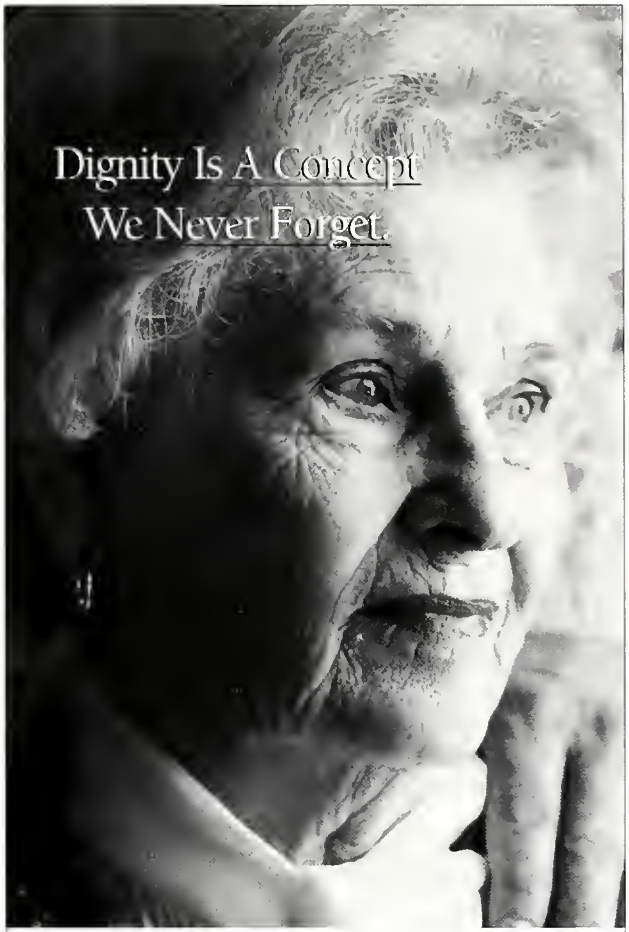
e-mail: yohn0001@mc.duke.edu



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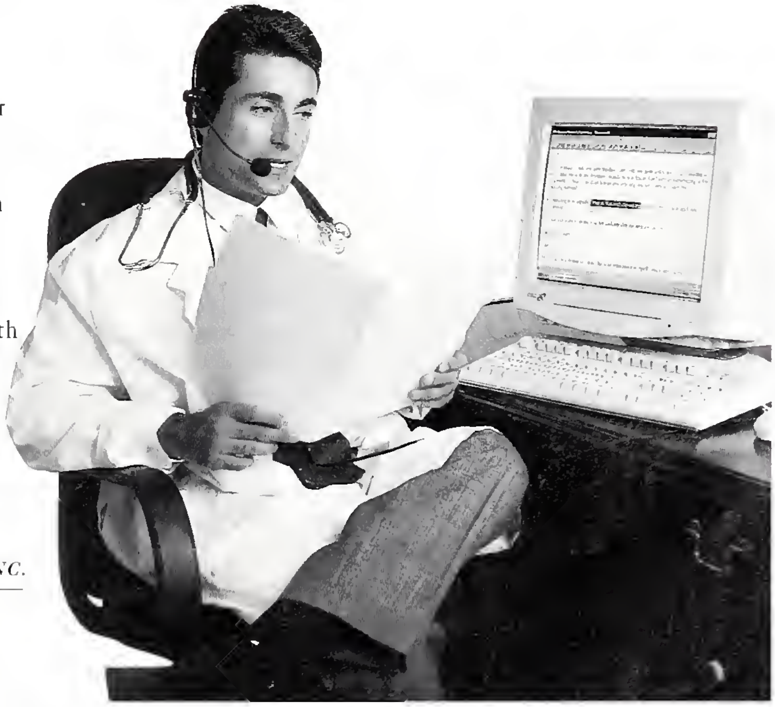

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Pfiesteria in North Carolina

The Medical Inquiry Continues

C. Gregory Smith, MD, MPH, and Stanley I. Music, MD, DTPH (London)

Pfiesteria piscicida (Pp) and several other recently discovered one-celled microorganisms called dinoflagellates have been linked to flesh ulcers in fish and to fish kills ("lesioned fish kills") in eastern US coastal waters.[1-3] Laboratory workers exposed to Pp toxins have developed transient, adverse neurocognitive effects, including memory disturbances, that have few, if any, residua. There are reports that individuals exposed to estuarine waters in Maryland in late summer and fall 1997, prior to and during lesioned fish kills, developed symptomatic neurocognitive deficits.[4-8] In this article, we review studies done to define the risks of Pp toxin exposure and the efforts under way in North Carolina to further address this problem.

There have been numerous fish kills in North Carolina, including many attributed to Pp. Researchers here and in Florida have identified at least 3 distinct and potentially toxic estuarine dinoflagellates belonging to 3 different genera (*Pfiesteria piscicida, Gyrodinium galatheanum, Cryptoperidiniopsis spp.*) from affected Maryland waters.[9] These dinoflagellates cannot be distinguished from one another without special preparation techniques, use of scanning electron microscopy, and evaluation by very well-trained eyes. The *Pfiesteria* look-alikes have been called *Pfiesteria*-like organisms (PLOs) and *Pfiesteria*-complex organisms (PCOs), but the terminology selected by the Centers for Disease Control and Prevention (CDC) is morphologically related organisms (MROs).[10]

Glossary of terms:

Pp	*Pfiesteria piscicida*
PLOs	*Pfiesteria*-like organisms
PCOs	*Pfiesteria*-complex organisms
MROs	morphologically related organisms
HABs	harmful algal blooms
EAS	estuary-associated syndrome

P piscicida releases at least two different exotoxins (one water soluble and one lipid soluble.[9] These toxins are reported to produce ulcerative lesions and neurologic effects in fish,[2,3,11] but so far no field observation has conclusively demonstrated that ulcers are caused by Pp or MRO toxins. The lesions are chronic and are not induced at the time of acute fish kills. It is likely that an injury to fish epidermis (due to trauma, pathogens, parasites, or possibly sublethal exposure to dinoflagellate toxins) permits invasion by opportunistic bacterial and fungal pathogens. In fact, fungal invasion is so common that the term ulcerative mycosis has been used for these lesions.[11]

Despite much effort over the past 5 years, Pp toxins have not been chemically identified nor have standard animal bioassays provided any significant information on target organs or mechanism(s) of action. One problem is that the toxins appear to be unstable and degrade rapidly.[3] In contrast, the endotoxins associated with red tides and other harmful algal blooms (HABs) that cause human illness primarily via consumption of contaminated shellfish and finfish are heat- and cold-stable.

In January 1998, a CDC-sponsored workgroup reviewed the 1997 findings from Maryland and other existing data. Because the reported adverse effects could not be attributed to a specific dinoflagellate or toxin, the workgroup suggested using the term "estuary-associated syndrome" until we learn more about these organisms and the toxins they produce. Various scientific panels and committees have concluded that there likely are differences in the geographic distribution and ecology of Pp and MROs, and that these species may produce many toxins.[12] Differing toxins having different mechanisms of

---

Dr. Smith is Chair, NCMS Occupational and Environmental Health Committee, Adjunct Associate Professor, Dept. of Epidemiology, UNC School of Public Health, and medical epidemiologist in the NC Dept. of Health and Human Services/Occupational and Environmental Epidemiology Section (DHHS/OEES). Dr. Music is a medical epidemiologist retired from the US Centers for Disease Control and Prevention. He served as Section Chief of the DHHS/OEES from Nov. 1996-May 1998. He was instrumental in securing from the CDC approximately $1 million (recurring for the next 3-5 years) for research in NC on the potential adverse health effects associated with *Pfiesteria*.

action will complicate exposure assessment, medical evaluation, and attribution of etiology of the potential adverse health effects of these organisms.

Historical Perspective

Red tides and other HABs have been documented since biblical times, and were known to North American and Caribbean Indians when Spanish explorers arrived here. Currently, 5 well-defined clinical illnesses (neurotoxic shellfish poisoning [NSP], paralytic shellfish poisoning [PSP], diarrheic shellfish poisoning [DSP], ciguatera fish poisoning [CFP], and amnesic shellfish poisoning [ASP]) are associated with specific toxins produced by dinoflagellates and diatoms. These illnesses[13-15] result from consumption of contaminated shellfish (which accumulate the toxins via filterfeeding) or finfish (which accumulate toxins via bioaccumulation/bioconcentration). Eye, skin, and respiratory irritation have been attributed to toxins produced by the red tide dinoflagellate, *Gymnodinium breve,* and aerosolized by surf action.[3,16]

History documents the adverse health effects of HABs, and there is growing concern that such blooms are becoming more frequent and widespread. Why this should be so is not clear, but possible factors include climate change, nutrient loading of estuarine and marine waters, global transport of unprocessed seafood, and distribution of dinoflagellates around the world via the discharge of ballast or bilge waters from ships. Clinical illnesses due to specific dinoflagellates may occur anywhere ships release toxin-producing dinoflagellates into waters that are conducive to blooms. In addition, the rapid global transport of seafood harvested from waters where algal toxins are endemic increases the chances of human illness.[17-20]

In 1987, the Occupational and Environmental Epidemiology Section (OEES) of the NC Division of Epidemiology investigated a cluster of neurotoxic shellfish poisonings caused by a red tide that struck the North Carolina coast on Halloween. Shellfish beds were closed and the State Health Director issued a health advisory.[21] It is likely that water currents transported the red tide from the Gulf of Mexico, through the Straits of Florida, to the Gulf Stream where an onshore eddy seeded North Carolina's coastal waters.[22] That same year, state public health physicians encountered an unprecedented outbreak of ciguatera fish poisoning linked to fish caught off the North Carolina coast.[23]

Since May 1994, public health physicians in the OEES, in collaboration with other scientists and physicians, federal health and environmental agencies, and the private sector, have sought to determine whether *Pfiesteria piscicida* and MROs cause adverse human health effects and pose a significant risk to public health—and if so, what are the risk factors for illness? These efforts have included surveillance for evidence of human (as well as wildlife and pet) illness, surveillance of estuarine areas during fish kills, epidemiologic investigation, and independent medical review of "cases" of illness following exposure to estuarine waters (both in the presence and absence of lesioned fish kills), descriptive epidemiologic studies of individuals exposed to lesioned fish kills attributed to *Pfiesteria,*[24] and analytic epidemiologic studies of occupationally exposed cohorts of watermen.[25-26]

The most recent inquiry involved rigorous medical evaluation (including neurocognitive testing) of 67 persons by a team of medical specialists from three North Carolina medical schools. It was designed and conducted under the guidance of an independent expert Task Force on Health Risk from Exposure to Fish Kill Waters, chaired by William Roper, dean of the UNC School of Public Health. The panel's preliminary conclusion is that there is no evidence of severe, chronic, or widespread adverse health effects from exposures to fish kill waters in North Carolina. This independent review supports similar conclusions reached by the state's public health physicians. Also, it is consonant with follow-up assessments of those reported to have suffered neurocognitive deficits from exposure to fish kill waters in Maryland. All deficits reportedly returned to normal within 6 months of exposure.[27]

Despite occasional misleading and inaccurate information presented in the lay press and on television, no physician practicing in North Carolina has yet reported a North Carolina "case" of human illness plausibly attributable to Pp or MROs. Virtually every suspect case has been attributed to other, more common and well-described causes. There have been no findings of any consequence, and no clusters of people reporting syndromic symptoms after exposure to estuarine waters or these organisms. In summary, a long series of surveillance and research efforts conducted by both state government and university sources has consistently come up empty.

Despite the reports from Maryland, no clusters of disease have been identified in any other state where Pp and MROs have been found, even when associated with lesioned fish kills. We have known about Pp for 7 years and suspected it of causing or contributing to many large fish kills during the past 10 years. Until recently, there have been virtually no formal warnings about or restrictions on entry or use of affected fish kill waters. Considering the thousands of human and animal exposures to estuarine waters during this period, one would think that physicians, veterinarians, or wildlife authorities would have noticed something unusual if these organisms produced clinically significant levels of biotoxins. The absence of clinically apparent illness is reassuring, but it is possible that subclinical illness may have occurred, but was not detected.

There has been much discussion of seafood-borne risks from Pp and MROs, but there are few appropriate studies. The absence of outbreaks of seafood-borne illness during or after major lesioned fish kills in North Carolina, Virginia, and Maryland is reassuring. The observed instability of Pp toxins (compared to those that cause shellfish and fish poisoning) and limited data showing that neurocognitive deficits do not follow consumption of seafood[8] suggest that there is no significant public health risk from consumption of normal-appearing finfish and crabs harvested from waters containing Pp and MROs.

Definitive answers to these questions await identification and characterization of *Pfiesteria* biotoxins.

Rash/Skin Lesions

A number of erroneous reports have attributed rashes and other skin lesions to Pp and MROs. Some have even included pictures of human skin ulcers juxtaposed to fish ulcers.[28-29] Thorough evaluation of reported cases by OEES medical epidemiologists, as well as by dermatologists in both North Carolina and Maryland, has attributed most cases to bacteria and other microbes common to estuarine waters and known to cause rashes, boils, ulcers, and other skin problems. Sometimes skin lesions were caused by chronic irritation and trauma associated with fishing and crabbing and from occupational sun and water exposure; still others were unrelated to water exposure.

Burning or stinging of the skin after water contact was reported by 9 of 13 patients in Maryland who had direct contact with putatively "toxic" estuarine water. A few demonstrated red, edematous papules on the trunk or extremities. Skin biopsies from 6 patients showed variable and nonspecific inflammation suggesting "reactive erythema," allergic, toxic, or eczematous reactions.[30] Clinicians need to know that dinoflagellates are not known to invade human skin or colonize wounds, and that no known lesions or histopathologic findings are pathognomonic for Pp and MROs.

Patients with possible Pp/MRO exposure and unexplained skin findings should be referred to a dermatologist. Photographs and biopsies of lesions are recommended when clinically indicated.[30] Despite the present lack of significant dermatologic findings, one of the toxins produced by Pp is the suspected cause of dermonecrotic effects in fish, and the contention that Pp causes irritation, paresthesia, and other dermatologic problems in humans is not implausible. We need further study to validate or invalidate these claims.

Neurologic Symptoms/ Neurocognitive Deficits

Culture of Pp (stimulated to produce toxin) in improperly ventilated laboratories has led to neurologic symptoms and neurocognitive impairment (as well as skin rashes and a host of nonspecific complaints) among some scientists and laboratory workers.[31] The nature and intensity of exposure under these conditions is only poorly understood and partially documented, and the route of exposure (inhalation of aerosols, or absorption from skin or mucous membranes) remains unclear. In addition to case reports of laboratory exposures, some animal evidence supports Pp toxins as a cause of neurocognitive impairment. Rats injected with water taken from aquaria containing toxic Pp demonstrated significant learning impairment (compared to controls), which persisted up to 10 weeks after injection. At necropsy, no gross or histopathological abnormalities were noted in the major potential target organs of exposed rats.[32]

In August 1997, a multispecialty medical team from the University of Maryland and Johns Hopkins University examined 13 persons who had been exposed to estuarine waters containing toxic Pp and MROs. Other than minor dermatologic findings (see above), physical examination was unremarkable and all ancillary laboratory evaluations (blood counts, blood chemistries, liver and renal function profiles, immune system profiles, pulmonary function tests, etc.) were unremarkable. Routine mental status examination was normal, but subjective and objective difficulties with learning and memory were associated with exposure to affected waters.[4-7]

The Maryland investigation had serious design problems that hamper meaningful interpretation (the examiners were not blinded; there were no contemporaneous controls; "case" detection depended almost exclusively on neuropsychological tests), but the effort was undertaken in good faith by talented scientific and medical professionals who, like their counterparts elsewhere, have been constrained by the lack of a specific biomarker for exposure to Pp. We are not entirely sure what organisms the Maryland people were exposed to, but they include at least one look-alike dinoflagellate of a different genus, *Cryptoperidiniopsis*. This dinoflagellate was present in the affected Maryland waters and has been associated with major recent lesioned fish kills in Florida. The best we can say is that a possible new disease entity (estuary-associated syndrome) exists, but its conclusive definition awaits identification of the putative biotoxins and development of true, objective measures for exposure and disease.

What is Under Way

Normally, the "discovery" of a new disease of public health importance leads to an organized surveillance for the disease. Usually this means making the disease reportable and asking physicians and laboratories to report confirmed, suspected, or possible cases to the state health agency. This is not yet possible for Pp and MROs.

In 1997, Congress appropriated $7 million to evaluate the public health aspects of *Pfiesteria*. A multistate cooperative agreement under the auspices of the CDC took effect earlier this year and is expected to continue for several years. North Carolina has benefited from this, and from special state funds made available to the OEES. The NC component of a standardized multistate surveillance effort[33] will begin this summer.

A planned prospective cohort study involving several states will enroll up to 200 North Carolina fishermen and crabbers who work in estuaries where Pp and MROs live, and compare them to matched controls (fishermen who work in ocean waters presumably free of significant numbers of these organisms). This study will resolve the difficulties associated with earlier retrospective studies by having baseline clinical and neuropsychological data before exposure to estuarine waters and by having the study participants serve as their own internal controls. Extensive efforts will be made to obtain water samples to assess exposure to organisms and their toxins. The current lack of quick assays for the toxins is being addressed vigorously by federal and university research teams and will be incorporated into the study should they become available.[34] The North Carolina research will be conducted by a consortium of the UNC-CH, Duke, and ECU medical schools and the UNC School of Public Health. Studies will include comprehensive medical evaluations with neuropsychological testing. If successful, by next summer we may know better whether there are adverse human health effects from exposure to these dinoflagellates in the natural environment.

Personal Protective Equipment

Until the risk of exposure to Pp and MROs is better defined, North Carolina public health officials recommend that risky waters (those containing HABs and fish kills) be avoided by all except state employees collecting water and fish samples. The OEES has developed a prevention-oriented protocol for workers that includes the use of personal protective equipment (PPE) to minimize exposure to putative toxins. The work protocol is designed to minimize the very real risk of heat stress and heat stroke while using respirators and protective clothing in hot weather. Work personnel will be educated and trained in risk prevention. The PPE protocol has been reviewed by a subcommittee of the NCMS Occupational and Environmental Health Committee, which includes occupational medicine physicians from Duke and ECU, and has been submitted to the *Pfiesteria* Task Force for review.

A toll-free hotline (888/823-6915) is available for questions about the location of current fish kills, to provide information for anyone who may have been exposed or affected, and to serve as an elementary surveillance mechanism for possible HAB-related illness. The OEES is providing communications upgrades to county health departments, so that the latest information will be just a local phone call away for citizens and health care providers alike. There are plans for a *Pfiesteria* home page on the World Wide Web. Special web access for clinicians providing updates and diagnostic information and assistance will be included. OEES public health staff will continue to attend and present CME sessions and updates at various scientific and medical meetings, including those sponsored by local medical societies, as well as state and federal health agencies.

Although HABs are but one cause for fish kills, the state currently posts advisory notices regarding all fish kills, and continues to warn people to avoid them, as common sense would dictate. In addition, a protocol for closing and reopening rivers and other coastal waters affected by HABs has been developed and can be implemented at the discretion of the State Health Director. A central point of contact for all *Pfiesteria* and HAB issues is Kathleen Buckheit, MPH, RN, COHN-S. Ms. Buckheit is an occupational health nurse and the newly installed head of the OEES's Harmful Algal Blooms Program. Her number is 919/715-6422. ❑

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The Impact of Diabetes Mellitus on Cardiovascular Disease in North Carolina

Ronny A. Bell, PhD, MS, Sara Huston, PhD, Kristi Passaro, PhD, and Eugene Lengerich, VMD, MS

Cardiovascular disease (CVD) is a major health burden for the citizens of North Carolina. It is the leading cause of death in North Carolina (for example, 26,249 deaths or 40% of all deaths in 1995).[1] The costs for hospitalization for CVD in NC during 1996 were $1.8 billion (26% of all hospitalization charges in the state). CVD accounts for approximately 135,000 hospital discharges (17% of all hospital discharges in the state).[2]

A number of factors increase the risk of developing cardiovascular disease: age, male gender, tobacco use, high blood pressure, elevated blood cholesterol, increased dietary fat, increased blood homocysteine, obesity, physical inactivity, and diabetes mellitus.[3] Diabetes is the 7th-leading cause of death in North Carolina (1747 deaths in 1995[1]), but in addition doubles the risk of heart disease and stroke.[4]

In this paper we describe the impact of diabetes on the burden of cardiovascular morbidity and mortality in North Carolina using data from a variety of sources to assess diabetes-related CVD mortality, hospitalization, and risk factor status. We also outline current, ongoing activities in the state aimed at reducing the burden of diabetes and CVD.

Methods

Prevalence of diabetes. We used data from the Behavioral Risk Factor Surveillance System (BRFSS), an ongoing, randomly dialed telephone survey of noninstitutionalized adults (at least 18 years old) across the state, to estimate the prevalence of diabetes. Persons were classified as having diabetes if they responded "yes" to the question, "Have you ever been told by a doctor or other health professional that you have diabetes?" The rates calculated for this report are limited to individuals aged 18 and older. To enhance the precision of estimates, BRFSS data from 1991 through 1995 were combined and an average prevalence calculated for the 5-year period. Because only a small number of BRFSS respondents described their race or ethnicity as other than non-Hispanic white or non-Hispanic black, only those in these two largest groups were included in this analysis.

Diabetes-related CVD mortality. Data from the Mortality Database of the State Center for Health Statistics[1] were used to determine the rate of death from different types of cardiovascular disease according to diabetes status. The following CVD-related ICD-9 codes were included as a primary cause of death: coronary heart disease (410.0-414.9, 429.2); stroke (430.0-438.9); hypertensive heart disease (402.0-402.9); congestive heart failure (428.0), and noncoronary atherosclerosis (440.0-440.9). Diabetes as a contributing cause of death was identified based on ICD-9 250.

The number of deaths for each type of CVD were gathered for cumulative years 1991-1995. The data were stratified by age group and by white or black (African-American) race. The denominators used to calculate CVD mortality rates were derived from BRFSS data-based age- and race-specific population estimates for the adult population of persons with and without diabetes. These data are reported for all adults, and for adults between the ages of 45 and 64 (to estimate premature CVD mortality). In addition, we calculated the mean age of death for each type of cardiovascular disease, both overall and with or without diabetes as a contributing cause of death.

Diabetes-related CVD hospitalization. Data from the Hospital Discharge Database of the State Center for Health Statistics[2] were used to determine the number of discharges and the total hospitalization charges associated with diabetes-related CVD hospitalizations in NC. We gathered data for all discharges with a primary diagnosis of CVD in which diabetes was listed as a

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secondary condition and, for comparative purposes, for discharges which listed diabetes and CVD separately.

CVD risk factors. Data from the 1991-1995 North Carolina BRFSS were used to estimate the prevalence of self-reported CVD risk factors (smoking, high cholesterol, high blood pressure, physical inactivity, overweight, inadequate fruit and vegetable consumption, low income, and low educational attainment) in those with diagnosed diabetes. We defined current smokers as those who had smoked at least 100 cigarettes in their entire life and who currently smoked. Diagnoses of high blood cholesterol and high blood pressure were based on affirmative responses to BRFSS questions. Physical inactivity was defined as engaging in no leisure-time physical activity. Overweight was defined as a body mass index (calculated from the self-reported weight in kg divided by the self-reported height in m^2) of at least 27.8 kg/m^2 for men and 27.3kg/m^2 for women. We compared persons who reported eating 5 or more daily servings of fruits and vegetables (the recommended minimum) to those who reported fewer than 5 servings per day. Annual household income was dichotomized into <$15,000 or ≥$15,000, and educational level was dichotomized as below 9th grade or 9th grade or higher. We used Chi-square analyses to test whether CVD risk factor status differed by diabetes status. Data were analyzed using SUDAAN, which takes into account the complex survey design of the BRFSS. Differences in proportions were considered significant if p was <0.05.

Table 1. Diabetes in North Carolina adults, 1991-1995

	Percentage with diabetes	Total number with diabetes
All adults (aged 18 and older)	5.1	267,800
Non-Hispanic white adults	4.6	187,700
Age groups		
18-64	3.0	101,700
65-74	13.4	56,100
75+	10.4	28,100
Non-Hispanic black adults	7.2	75,800
Age groups		
18-64	5.0	45,500
65-74	21.5	18,300
75+	20.9	12,100

Source: NC Behavioral Risk Factor Surveillance System, Department of Health and Human Services, Raleigh

Results

Table 1, above, shows the prevalence of diabetes among adults in North Carolina during 1991-1995. Approximately 5% of adults had been told by a health professional that they had diabetes, meaning the total number of affected persons in NC was approximately 260,000. Diabetes prevalence was approximately 57% higher among non-Hispanic black adults than among non-Hispanic white adults. After age 75, the prevalence of diabetes among non-Hispanic blacks was more than twice as high as among non-Hispanic whites. As expected, the percentage of the population with diabetes increased with age.

Table 2, next page, shows crude mortality rates and rate ratios for various types of CVD death among persons with and without diabetes. For all white adults, the increased CVD mortality that accompanied diabetes ranged from 10% (atherosclerosis) to 200% (hypertensive heart disease). For 45- to 64-year-old white adults, the mortality ascribed to hypertensive heart disease was increased 250% by the presence of diabetes.

The rate ratios for black adults were not as pronounced as those for whites. The increase in CVD mortality due to diabetes ranged from 30% (congestive heart failure) to 130% (hypertensive heart disease). For 45- to 64-year-old black adults, diabetes-related increases in CVD mortality were found for hypertensive heart disease (10%) and coronary heart disease (20%), but rates for diabetes-associated atherosclerosis, stroke, and congestive heart disease mortality were actually lower than when diabetes was not listed as a contributing cause of death.

The impact of diabetes is shown by the fact that the mean age at death was 3.5 years younger when diabetes was listed on the death certificate along with a CVD diagnosis than when diabetes was not listed. The mean age at death for the 66,412 individuals for whom diabetes was not listed was 77.4 years; the mean age at death was 73.9 years for the 7220 individuals for whom it was listed. The magnitude of the difference ranged from 1.5 years for hypertensive heart disease to 5.7 years for atherosclerosis. These figures mean that more than 25,000 person-years of life were prematurely lost because of diabetes during this 5-year time period.

Table 3, next page, shows the number of diabetes-related CVD hospitalizations and the accompanying hospital charges. In 1996, there were 32,511 diabetes-related CVD hospitalizations, accounting for 201,400 hospital days and $417 million in charges. Diabetes-related CVD hospitalizations comprised nearly one-third of all diabetes-related hospitalizations (31% of discharges; 29% of days; 37% of charges), and approximately one-fourth of all CVD-related hospitalizations (24% of discharges; 25% of days; 24% of charges).

Table 4, page 225, compares the prevalence of CVD risk factors by diabetes status. Compared to persons without diabetes, those with diabetes were 51% more likely to report ever being told of high cholesterol and 13% more likely to report high blood pressure. Persons with diabetes were 35% more likely to be physically inactive and 94% more likely to be overweight than persons without diabetes. Persons with diabetes were also more likely to be of a lower socioeconomic status

Table 2: Mortality rates* for diabetes and cardiovascular disease in North Carolina, 1991-1995

	Adults	White adults	White adults 45-64 years	Black adults	Black adults 45-64 years
Coronary heart disease					
Rate with diabetes	321.3	347.3	175.8	267.5	167.0
Rate without diabetes	145.6	150.4	81.1	136.9	141.3
Ratio	2.2	2.3	2.2	2.0	1.2
Stroke					
Rate with diabetes	151.5	141.8	38.8	178.3	74.8
Rate without diabetes	85.4	82.8	23.8	102.2	91.7
Ratio	1.8	1.7	1.6	1.7	0.8
Hypertensive heart disease					
Rate with diabetes	33.2	24.5	12.6	55.1	38.6
Rate without diabetes	11.2	8.1	3.6	24.4	36.6
Ratio	3.0	3.0	3.5	2.3	1.1
Congestive heart failure					
Rate with diabetes	25.1	27.2	8.3	20.6	8.1
Rate without diabetes	16.8	17.5	2.8	15.5	9.2
Ratio	1.5	1.6	3.0	1.3	0.9
Atherosclerosis					
Rate with diabetes	8.1	8.3	2.6	7.4	2.5
Rate without diabetes	7.6	7.6	1.6	8.4	3.3
Ratio	1.1	1.1	1.7	0.9	0.8

*Mortality rates represent the unadjusted number of deaths per 100,000 population, using the average 1991-1995 estimated annual population of NC. Ratios are obtained by dividing the rate with diabetes by the rate without.
Source: State Center for Health Statistics, DHHS, Raleigh

Table 3. Hospital statistics related to diabetes and cardiovascular disease (CVD), North Carolina, 1996

	CVD with diabetes	Total diabetes	CVD related	Total CVD	Diabetes related
Discharges	32,511	103,535	31.4%	135,799	23.9%
Hospital days	201,400	691,760	29.1%	819,596	24.6%
Charges*	$417	$1,130	36.7%	$1,780	23.5%

*Charges in millions of dollars. Source: State Center for Health Statistics, DHHS, Raleigh

(that is, to have less formal education and lower annual household income). On the other hand, persons with diabetes were less likely to be current smokers (19% vs 26%), and more likely to eat 5 or more servings of fruits and vegetables per day (79% vs 82%).

Discussion

Cardiovascular disease and diabetes mellitus put a heavy health burden on the citizens of North Carolina. The presence of diabetes increases the rate of death from coronary heart disease, hypertensive heart disease, congestive heart failure, and stroke. Not only are North Carolinians with diabetes more likely than those without to die of CVD, they are more likely to die at a younger age.

Some of the effects of diabetes on CVD may be related to the presence of traditional risk factors for CVD. Persons with diabetes are more likely to report having high blood pressure or high blood cholesterol, and to be overweight and physically inactive. Our findings illustrate the need for improved diabetes prevention and management strategies as a part of CVD prevention efforts in the state.

This report may underestimate the true impact of diabetes on cardiovascular disease since, according to the National Health and Nutrition Examination Survey III, about one-third of all persons with diabetes have not been diagnosed. It is likely that there is significant underreporting of the contribution of diabetes to CVD morbidity and mortality, but by our conservative estimates, diabetes causes the loss of approximately 4565 years of potential life to CVD every year. It increases CVD-related hospitalization charges by at least $417 million annually.

Our data demonstrate the enormous opportunity we have to reduce chronic disease risk by developing partnerships among state organizations, and among public and private health agencies. The NC Heart Disease and Stroke Prevention Task Force, in collaboration with the NC Diabetes Control Program, is working to make North Carolinians more aware of the impact of diabetes on cardiovascular disease morbidity and mortality.

Table 4. Prevalence of cardiovascular disease risk factors in NC, 1991-1995

	Adults with diabetes (%)	Adults without diabetes (%)	Ratio
Current smoker	18.7†	26.3	0.71
High cholesterol	36.8†	24.3	1.51
High blood pressure	55.9**	49.4	1.13
Physically inactive[1]	49.0†	36.2	1.35
Overweight[2]	51.5†	26.5	1.94
Too few fruits and vegetables[3]	78.8*	82.4	0.96
Household income <$15,000/year	47.0†	23.8	1.98
Less than 9th grade education	22.2†	6.9	3.22

[1] No leisure-time physical activity.

[2] Body mass index >27.7 for men and 27.2 for women.

[3] Less than 5 servings/day (based on 1994 data only).

Statistical significance using Chi-square test: *p<0.05; **p<0.01; †p<0.001.

Source: NC Behavioral Risk Factor Surveillance System, DHHS, Raleigh

The Diabetes Complications and Control Trial[6] showed that strict control of blood sugar lowers the risk of diabetic macro- and microvascular disease. This means that primary care physicians must pay particular attention to the management of diabetes. The prevalence of diabetes self-care measures (such as self-monitoring of blood glucose) and of physician visits for diabetes-related complications are relatively low in the state.[7] Legislation passed by the NC Legislature in June 1997, requires third-party reimbursement for diabetes education, supplies, and medication. This should enhance the personal management of diabetes, and potentially reduce the burden of diabetes-related CVD.

Guidelines are being developed by the Patterns of Care Task Force of the NC Diabetes Advisory Council for the care of persons with diabetes.[8] These guidelines, in agreement with national recommendations, stress the need for routine physician monitoring for the presence of CVD and CVD risk factors (blood cholesterol and subfractions of cholesterol; blood pressure) in persons with diabetes. The guidelines also instruct physicians to stress the need for patients with diabetes to adhere to lifestyle recommendations regarding physical activity, dietary management, smoking cessation, and regimens to lower blood cholesterol and blood pressure that will reduce CVD.

We have found the prevalence of diabetes to be much higher among blacks than non-Hispanic whites, but diabetes-related cardiovascular disease mortality was lower among blacks. This phenomenon has been observed by others in regards to both diabetes-related morbidity and mortality,[9] and the risk factors associated with CVD.[10] One possible explanation is that blacks are more likely to die of other diabetes-related conditions, such as end-stage renal disease, or from diabetes itself (the rate of diabetes mortality among blacks in North Carolina is three times higher than among non-Hispanic whites[1]).

To conclude, our data indicate that diabetes mellitus contributes substantially to cardiovascular disease, the leading cause of death in this state. Health professionals need to stress primary and secondary prevention of CVD and diabetes, and to emphasize the tremendous impact of diabetes on cardiovascular disease in NC. Physicians should carefully monitor patients with diabetes for CVD and use a team approach (involving nutritionists and diabetes educators) to modify associated risk factors. Physicians should counsel patients at high risk for developing diabetes to closely monitor their health and to adopt healthy lifestyles so that the disease can be delayed or prevented—or treated early and aggressively in the event that diabetes does develop. ❑

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Why Don't Doctors Give Flu Shots to Medicare Patients?

Variations by Physician Specialty

Suzanne B. Craig, MD, MPH, PhD, Anna P. Schenck, MSPH, PhD, and Ross J. Simpson, Jr., MD, PhD, MPH

Influenza is a potentially serious disease that causes much morbidity and mortality, especially in individuals age 65 and older. Each year in the United States, influenza and its complications account for 10,000-40,000 unnecessary deaths, 80% of them in the elderly.[1] In 1995, 2134 North Carolinians age 65 and older died from influenza and pneumonia.[2]

The Advisory Committee on Immunization Practices recommends that persons age 65 and older be vaccinated annually to reduce the likelihood that they will contract influenza and to lessen complications if they do contract it.[3] Influenza vaccine reduces hospitalization for pneumonia and influenza among the noninstitutionalized elderly by 30%-70%.[3] Contraindications to influenza vaccination include allergy to egg or other components of the vaccine, and acute febrile illness.

Medicare Part B pays for the influenza vaccine, but in spite of this vaccination levels in North Carolina fall below the 60% target set by Healthy People 2000.[4] In 1996, only 44% of non-HMO beneficiaries age 65 or older were vaccinated for influenza in North Carolina. Among African-Americans immunization protection was 25%,[5] suggesting that minorities are underserved.

Physician recommendation is a key determinant of whether patients accept the vaccine,[6] but the factors that influence or inhibit physician administration of the vaccine have not been well researched. There are a number of potential barriers: patient refusal, lack of knowledge of how to submit a roster bill to Medicare (a simplified way to bill for influenza and pneumococcal vaccines), and difficulty in identifying appropriate patients. We undertook the present study to better understand physician attitudes and the barriers to vaccine administration, and to develop an intervention that would increase physicians' administration of influenza vaccine to Medicare patients.

Methods

In August 1997, Medical Review of North Carolina, Inc., (MRNC) mailed a one-page questionnaire to all 724 internists, family practitioners, general practitioners, and gerontologists in Alamance, Durham, Wake, Orange, Forsyth, and Guilford counties. We sought to identify their attitudes about vaccine administration and their perception of barriers to administering the vaccine. The questionnaire was mailed in early August, and 10 days later a second mailing was sent to those who had not responded. Survey questions used a 5-point scale (ranging from "strongly agree" to "strongly disagree") to measure attitudes about the vaccine, and another 5-point scale (ranging from "not at all" to "a great deal") the assess the extent to which specified factors hampered vaccine administration.

For analysis, responses to the questions were dichotomized. Questions about attitudes toward vaccine administration were analyzed by comparing those who agreed with those

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The authors are affiliated with Medical Review of North Carolina, a private, not-for-profit, physician-sponsored organization dedicated to maintaining and improving the quality of health care for North Carolinians. Dr. Schenck is also with the Department of Health Behavior and Health Education, School of Public Health, UNC-Chapel Hill. Dr. Simpson is also with the Department of Medicine, UNC-Chapel Hill. This study was performed under contract No. 500-94-0613 (Operation of Utilization and Quality Control Peer Review Organization (PRO) for the State of North Carolina, sponsored by the Health Care Financing Administration, Department of Health and Human Services). The conclusions and opinions expressed, and methods used herein are those of the authors. They do not necessarily reflect HCFA policy. The authors assume responsibility for the accuracy and completeness of the ideas presented. This article is a result of the Health Care Quality Improvement Program initiated by HCFA, which has encouraged identification of quality improvement projects derived from analyses of patterns of care, and therefore required no special funding on the part of this Contractor.

who disagreed with each question. Questions about potential barriers were analyzed by comparing those who reported a factor was a barrier ("a great deal" or "a fair amount of the time") with those who did not perceive the factor to be a barrier ("a little" or "not at all"). The question about knowledge of how to submit a roster bill to Medicare was analyzed by comparing "yes" to "no" or "not sure" answers. Data were analyzed, using SAS,[7] for all respondents and after stratification by county, and by specialty of physician. Logistic regression models, controlling for county of residence, were used to calculate an odds ratio (OR) and 95% confidence interval (95% CI) as a measure of association between each individual attitude or barrier and physician specialty.

Results

Overall, 413 physicians (57%) responded to the questionnaire. The specialty group with the largest number of respondents was internal medicine (n=261) followed by family practice (n=110), general practice (n=39) and gerontology (n=3). Responses from the three gerontologists were omitted from the stratified and regression analyses.

In general, physicians had positive attitudes about administration of the influenza vaccine (Table 1, next page); 97% agreed that administration to elderly patients (who have no contraindication) is "good medical care." The overwhelming majority (97%) also felt that the vaccine was safe and effective. Similarly, 92% of physicians were satisfied with their office approach to vaccine administration, and 94% said patients accepted the vaccine when recommended by the doctor.

> "If physicians do not recommend the vaccine because they feel patients will refuse, they preclude patients from getting an important factor that may influence them to get the vaccine—the recommendation of their doctor."

Several factors emerged as barriers to administration of the influenza vaccine to Medicare patients 65 years of age or older during the previous flu season (Table 2, next page). The most common was patient refusal, cited by 32% of physicians. The next most often reported barriers were the level of reimbursement (cited by 20% of physicians), and difficulty billing Medicare (14%). Ten percent reported difficulty identifying eligible patients. Overall, 78% of physicians responded that they did not know or weren't sure when asked whether their office staff knew how to complete a roster bill for the vaccine.

Analysis by specialty revealed several differences in attitudes about and barriers to vaccination (Table 3, next page). Compared to internists, general practitioners were six times more likely (OR=5.9, 95% CI: 1.7-19.8) and family practitioners, three times more likely (OR=3.0, 95% CI: 1.1-8.2) to report that patients would not accept the vaccine even when recommended. Similarly, physicians in general and family practice were more likely to report difficulty identifying possible candidates for the vaccine than physicians in internal medicine (OR=1.7, 95% CI: 0.6-4.9 and OR=1.5, 95% CI: 0.7-3.3, respectively).

Compared to internists, general and family practitioners were more likely to report difficulty in billing Medicare for the vaccine (OR=3.6, 95% CI: 1.5-8.4 and OR=1.5, 95% CI: 0.8-3.1, respectively). General and family practitioners were less likely to know how to roster bill than those in internal medicine (OR=1.1, 95% CI: 0.5-2.6 and OR=1.5, 95% CI: 0.8-2.6).

Discussion

We found that doctors have a generally positive attitude toward influenza vaccination. Nonetheless, there were barriers to vaccination that varied by physician specialty. General practice and family practice physicians were more likely to report barriers than were internists. We are not aware of other studies that have evaluated barriers by physician specialty, but our findings are consistent with other studies, which have found that, despite a positive attitude, barriers interfere with provision of preventive services.[8]

It appears that doctors have heard clearly the public health message about the importance of influenza vaccination. But despite their overall positive attitude about the vaccine, physicians may not always convey this attitude to their patients. Our respondents almost uniformly felt that vaccine was safe and effective. Yet they also reported patient refusal as the most prevalent barrier to administration of the vaccine. This indicates a troubling conflict: If physicians do not recommend the vaccine because they feel patients will refuse, they effectively preclude the patients from getting a very important factor that may influence them to get the vaccine—the recommendation of their doctor. We need additional research to better understand the dynamics of the physician-patient dialogue about the influenza vaccine.

Our survey indicates that difficulties identifying patients and billing Medicare for the influenza vaccine might be more of a barrier for physicians in general practice and family practice than internal medicine. Because interventions targeting those barriers might benefit selected physician groups, we developed an informational kit and distributed it to participating physicians and office managers. The intervention kit consisted of a tip sheet to help overcome barriers, an influenza fact sheet to help refute common myths leading patients to reject the vaccine, instructions for simplified Medicare billing (roster billing), chart reminder flags to help identify appropriate patients, information about vaccine administration, and buttons promoting the vaccine. (Interested readers may obtain an intervention kit by writing to Dr. Craig at Medical Review of North Carolina,

Table 1. Proportion of physicians with favorable attitudes toward influenza vaccine

To what extent do you agree with the following statements:	**Internal Medicine** n=261 (%)	**General Practice** n=39 (%)	**Family Practice** n=110 (%)	**Total*** n=413 (%)
Flu vaccine is good medical care	98	95	96	97
Flu vaccine is safe	97	92	96	97
Flu vaccine is effective	97	95	95	97
Office administration of vaccine is good enough	92	94	91	92
Patients accept vaccine when I recommend it	97	86	92	94

* Total includes three (n=3) gerontologists who are not represented elsewhere in the table.

Table 2. Perceived barriers to administration of influenza vaccine

Factors interfering with flu vaccine administration:	**Internal Medicine** n=261 (%)	**General Practice** n=39 (%)	**Family Practice** n=110 (%)	**Total*** n=413 (%)
Difficulty identifying patients	9	14	12	10
Patient refusal	32	19	38	32
Concerns about vaccine safety and efficacy	2	0	1	2
Difficulty billing Medicare	11	31	16	14
Not enough time	5	6	7	6
Level of reimbursement	19	28	17	20
Not sure office staff knows how to roster bill	78	76	8	78

* Total includes three (n=3) gerontologists who are not represented elsewhere in the table.

Table 3. Physician specialty and factors influencing vaccine administration*

Attitudes toward and factors influencing vaccine administration:	**Internal Medicine** (referent)	**General Practice** OR (95% CI)	**Family Practice** OR (95% CI)
Satisfied with office approach to administration	1.0	1.0 (0.2,4.6)	1.6 (0.7, 3.8)
Patients will not accept vaccine	1.0	5.9 (1.7, 19.8)	3.0 (1.1, 8.2)
Difficulty identifying	1.0	1.7 (0.6, 4.9)	1.5 (0.7, 3.3)
Difficulty billing	1.0	3.6 (1.5, 8.4)	1.5 (0.8, 3.1)
Level of reimbursement	1.0	1.5 (0.6, 3.5)	0.8 (0.4, 1.5)
Not sure office staff knows how to roster bill	1.0	1.1 (0.5, 2.6)	1.5 (0.8, 2.6)

* Models have been adjusted to control for county of residence. OR (odds ratio); CI (confidence interval)

Inc., 5625 Dillard Drive, Suite 203, Cary, NC 27511. Kits will be mailed in late August or early September.)

There are several limitations to our study. The modest response rate may limit the generalizability of our results, but it seems highly likely that the responders are at least as interested and involved in influenza vaccine administration as nonresponders would be. Thus, the survey probably has not overestimated the potential influence of barriers. In addition, the counties we studied are more urban than other North Carolina counties. Physicians in more rural areas may face a different array of barriers. Despite these concerns, we did identify several barriers to administration of the influenza vaccine. Knowledge of these barriers and implementation of strategies to overcome them can only help the health of our elderly citizens. Failure to immunize older adults who come to physicians' offices represents an important missed opportunity for clinical service. We must keep up our efforts to better understand and increase vaccine coverage. ❑

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Preventing Childhood Poisoning

Survey of a Family Medicine Residency Program

Heidi T. Kistler, Karl B. Fields, MD, Teresa Rasco, and Olakunle B. Akintemi, MD

In 1995, United States poison control centers (PCCs) reported more than 2 million cases of poisoning, 53% of them involving children under age 6.[1] Fortunately, the number of fatal incidents in young children has fallen significantly, from 445 in 1960 to 20 in 1995.[1,2] This decline has been attributed to the establishment and use of PCCs, child-resistant packaging, improvements in emergency care, reformulation of toxic products, and heightened parental awareness.[1] As important as these improvements are, they should not create a false sense of security. Nonfatal poison exposures continue to be a major cause of hospitalization and medical visits for young children.[2]

In most cases, childhood poisonings are the result of normal behavior. Children's innate curiosity, frequent hand-to-mouth activity, lack of judgment, and inability to read warning labels place them at high risk for accidental poisoning.[3] Some studies suggest the possibility of other factors—poor social supports, general child behavioral problems, or child neglect. These may add to the problem; there is no evidence that they are major considerations.[2-4]

Education can effectively prevent poisoning, but the individuals who would benefit most are not reached. Most elementary schoolchildren learn about poisons, but these efforts do not target children younger than 6 (or their parents).[2] People who do have routine contact with such parents are health care professionals, and we believe they are in a particularly good position to provide education about poison prevention. The American Academy of Pediatrics recommends that parents be advised about what household substances are most harmful; which substances are most commonly ingested; how to prevent children from getting access to them; and what to do in the event of a poisoning.[5] Two of the most important preventive measures a parent can take are to: 1) always store products and medicines in their original containers; and 2) always store potentially harmful substances out of sight, out of reach, and locked away from children.[6]

To assess how well parents and caretakers followed these guidelines, whether they knew how to handle an accidental poisoning, and to see how well primary care physicians address these issues, we interviewed patients of the Moses Cone Health System Family Practice Center (FPC) in Greensboro.

Methods

We ascertained which FPC patients were parents and/or primary caretakers of small children by asking, "Do any children age 6 or younger either live with you or spend a lot of time in your home?" A total of 66 patients affirmed that they were caretakers of children ages 6 and under. Of these, 64 agreed to answer a poison control survey (see Appendix, page 235). They were then interviewed in an exam room. Questionnaires were coded to determine frequencies to ensure privacy.

Participants were asked a series of questions about storage of commonly ingested poisonous substances (personal care products, cleaners, and vitamins and medicines). We also asked whether patients ever stored cleaners near food, and whether any medications were out-of-date. A second set of questions sought to determine whether the patients knew what to do in the event that a child in their care ingested any of these substances. We first asked an open-ended question about what the respondent would do in such a situation, then we asked if patients had syrup of ipecac available, and if so, when they would use it. We

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asked respondents about past experiences with PCCs and if they would know how to contact a PCC. Finally, to ascertain how well FPC residents and faculty address poisoning issues, we asked respondents whether a doctor in the FPC had ever talked to the patient about poison-proofing their home.

Results

Our survey population differed from the general population of Greensboro in three ways: 1) It was younger: 9% of the respondents were under 21; 48% were 21-30 years old; 28% were 31-40 years old; and 13% were 41 years old or older. 2) The overwhelming majority (95%) of respondents were women. 3) A disproportionate number were of lower-than-average socioeconomic groups (45% either had no insurance or received Medicaid assistance).

Of the 64 respondents, 15 (23%) reported that children in their care had experienced or were believed to have experienced an accidental poisoning; 14 of these 15 said someone in the household had called a PCC in response a poisoning event. Fifty-one of the 64 respondents (80%) said they knew how to contact a PCC; 29 said they had the number posted on or near the telephone,[7] or stated they would look for the number in the phone book or call information; 5 said they would call 911; 3 would call the hospital or knew the PCC number. Seven surveys had missing data.

When asked what they would do if a child in their care had an accidental poisoning, only 50% said they would call a PCC directly. Another 27% said they would either call a doctor, the hospital, or 911; 13% said they would take the child to the emergency room, hospital or doctor's office; 8% indicated they would take some kind of action (such as inducing vomiting); and 3% didn't know what they would do. In all, 21 of 64 respondents said they had previously contacted a PCC. Only 21 individuals reported having syrup of ipecac on hand at home.

Fifteen of the respondents said that an FPC doctor had talked to them about poison-proofing their home; the remainder said that the doctor had never spoken to them about this, or that they could not recall.

Nineteen individuals reported that they stored at least some of their household cleaners and detergents on a shelf or in an unlocked cabinet that was within reach of a child; 15 more said they stored at least some such materials on a shelf out of reach, but where a child could see them. One person reported storing cleaners near food. Only 14 said that they stored these products under lock. Eight of the 64 reported that they kept vitamins and medicines within reach of a child; 7 more said they stored medications in a location where a child could see them, and only 8 kept medicines and vitamins in a locked cabinet or closet. Eight people said they had some medicines that were out of date; the remaining 56 denied this, were unsure, or said they had no medications at home. Seventeen respondents stored cosmetics in an unlocked cabinet or on a shelf within reach of a child; 7 stored them out of reach but within sight; 7 said they were kept under lock. Our respondents said they rarely stored products in anything except the original containers. Of the few who said they changed containers, none used a "Mr. Yuk" sticker or other symbol to indicate poisonous substances in the container.

Table. Poisoning calls to Triad Poison Center*

Substance	Number of calls
Pharmaceuticals	530
Household cleaning	79
Chemicals	63
Cosmetics/personal care products	54
Insect/pesticides, rodenticides	35
Plants	28
Hydrocarbons	27
Alcohols	22
Bites	22
Paint	13
Gases (vapors/fumes)	9
Food	7
Foreign bodies	7
Batteries	5
Fertilizers	2
Unknown	5

*Unpublished data from the Triad Poison Center, the Moses Cone Health System, Greensboro, for the months of March-December 1996, and April 1997.

Discussion

The most common substances involved in poisonings of children under age 6 are cosmetics (and other personal care products), cleaning substances, analgesics, and plants.[1] The Greensboro regional poison center is most often called about pharmaceutical, household cleaner, chemical, and cosmetics or personal care product ingestion (see Table, above). The Greensboro statistics do not include regional reports to the state PCC, but since we have no specific data for children under age 6 in our region, we have no reason to believe they differ markedly from national statistics.

The practices of our respondents in storing 3 categories of hazardous substances were less than ideal since 17% (8 of 48) stored medications; 31% (19 of 61) stored cleaners and 30% (17 of 56) stored cosmetics so that they were accessible to children. Since we did not count as unsafe households where a substance was stored out of reach but in sight, our numbers are particularly troublesome. The difference in storage practices was not statistically significant, but it is worth noting that cleaners, which have a fairly high hazard factor, were stored as though they were cosmetics, which have a much lower hazard factor.[7]

Twenty-one of the respondents reported having syrup of ipecac available. Of those who did not, 3 said they intended to buy some or usually had some on hand. Although there has been some controversy over its use, the American Academy of Pediatrics still recommends having at least an ounce of ipecac per child in the household, as it can substantially reduce the amount of time a poison is in the body and thereby the damage the substance would cause.[8] Doctors can help ensure that parents keep ipecac on hand by recommending its use and even providing it directly. In those instances where keeping ipecac may be contraindicated (such as when someone in the household has an eating disorder or it is unlikely that it would be used only when appropriate), doctors may choose not to follow this recommendation. Otherwise, having syrup of ipecac readily available in the home is recommended. Future recommendations may include use of substances such as activated charcoals, as well as or instead of ipecac.[8]

One of the more positive findings from our survey is that, in the event of an accidental poisoning, most of our patients would seek medical care or advice in some form, whether over the phone or in the emergency room. This is preferable to treating the victim without medical advice, but our respondents did not suggest that they were ready to fully utilize the PCC—despite the fact that most were aware of the center's existence and knew how to contact it.[8] This suggestion of underutilization is problematic for several reasons. First, taking a child to the hospital or doctor's office may unnecessarily delay treatment. Second, the annual cost of not using PCCs is estimated at $975,000,[8] an unnecessary drain on already overburdened resources. Finally, underutilization escalates the threat of budget cuts, which many PCCs are now facing.[3]

Physicians have a role in poison education, but only one-fourth (15) of the individuals we interviewed recalled having spoken to a doctor about poison prevention. Similar results have been found in a study of pediatric residents, who spent little time discussing injury prevention.[9] Since so few of our respondents recall being instructed, either our doctors are not routinely addressing this issue with their patients, or, if they are, they are not making a lasting impression. The need for such discussion is underscored by the fact that 25% of those in our survey reported personal experience with childhood poisoning.

> "Since so few of our respondents recall being instructed (in poisoning prevention), either our doctors are not routinely addressing this issue with their patients, or, if they are, they are not making a lasting impression."

Conclusion

We need to improve our education of parents and caretakers about poisoning prevention. Poisoning is the most common medical emergency of young children,[10] but few patients recall doctors giving them information about poison prevention. Education about safe storage of potentially harmful substances might be particularly helpful since 17%-31% of our respondents admitted to unsafe storage of household cleaners and detergents, medications, and cosmetics and personal care products. Considering that the highest frequency of poisonings occurs in children age 6 or younger, health care personnel are the logical source of specific information about poison prevention. This should include, at least, instruction about safe storage of poisons, having ipecac in the home, and knowing when and how to contact a PCC. ❑

See Appendix and Commentary, next page

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Appendix. Survey Questionnaire

We are taking a survey on poison prevention. Would you be willing to answer a few questions?

1. Do any children age 6 or younger either live with you or spend a lot of time in your home? (if no, do not continue) *yes* *no*
2. How old is each child? (list)

I'd like to ask you a few questions about where you store things at home.

3. Where do you keep cosmetics and personal care products, such as shaving cream, make-up, hair spray, or lotions? (check all that apply)
   ___ in a cabinet or closet. Could a child reach it? *yes* *no* *sometimes*
   Is it locked? *yes* *no* *sometimes*
   ___ on a shelf. Could a child reach it? *yes* *no* *sometimes*
   If no, could the child see what is on the shelf? *yes* *no* *sometimes*
   ___ other (explain):
4. Do you sometimes put these products in a different container than they came in? *yes* *no*
   If yes, do you label them? *yes* *no* If yes, how are they labeled?
5. Where do you keep cleaners (for oven, windows, bathroom,etc.) and detergents? (check all that apply)
   ___ in a cabinet or closet. Could a child reach it? *yes* *no* *sometimes*
   Is it locked? *yes* *no* *sometimes*
   ___ on a shelf. Could a child reach it? *yes* *no* *sometimes*
   If no, could the child see what is on the shelf? *yes* *no* *sometimes*
   ___ other (explain):
6. Do you sometimes put cleaners in a different container than they came in? *yes* *no*
   If yes, do you label them? *yes* *no* If yes, how are they labeled?
7. Do you sometimes store them near food? *yes* *no*
   If yes, specify where (same shelf or cabinet, etc.):
8. Where do you store vitamins and medicines in your home (both prescription and nonprescription)? (check all that apply)
   ___ in a cabinet or closet. Could a child reach it? *yes* *no* *sometimes*
   Is it locked? *yes* *no* *sometimes*
   ___ on a shelf. Could a child reach it? *yes* *no* *sometimes*
   If no, could the child see what is on the shelf? *yes* *no* *sometimes*
   ___ other (explain):
9. Do you sometimes put medicines or vitamins in a different container than they came in? *yes* *no*
10. Do you have some medicines that are out of date or old?
    yes *no* *don't know*
11. What would you do if you knew or thought that your child had swallowed any of the items we just talked about?
12. Do you have syrup of ipecac in your house? *yes* *no*
    If yes, when would you use it?
13. Has any child in your care ever had an accidental poisoning? *yes* *no*
    If yes, describe:
14. Would you know how to contact a poison control center if you wanted to? *yes* *no* If yes, how?
15. Have you ever contacted a poison control center? *yes* *no*
    If yes, why?
16. Has any doctor here at the Family Practice Center ever talked to you about "poison-proofing" your home? *yes* *no* *don't recall*
17. What poisonous substance are you most afraid your child might swallow?

Respondent's name ______________________________
age: 20 or less ___ 21-30 ___ 31-40 ___ 41+ ___

Commentary

by Shirley K. Osterhout, MD

The paper by Kistler, Fields, Rasco, and Akintemi can do a great deal of good, especially for physicians who care for children. No one teaches *safety*. There are many hazards for the young child, and the teaching of safety needs to emphasize that unintentional tragedy can be prevented if all child care providers (parents, grandparents, day care workers, etc.) are aware of the risks and what can happen, depending on the developmental stage that the child is going through. For example, poisoning easily develops when a 3-month-old is given the wrong dose or the wrong medicine; on the other hand, a 10-month-old who is just beginning to crawl on the floor may find attractive green pellets of rat poison behind a chair. At each visit, doctors should discuss safety issues, along with the developmental issues of feeding, immunization, etc.

One problem the authors do not mention needs to be pointed out. Most childhood poisonings happen when the product (household cleaner, medicine, etc.) is used and then left out and available. Locking it up and out of the way after every use is critically and absolutely essential. I would have been interested in the circumstances under which 25% of Kistler's respondents had already experienced an "accidental" poisoning. Was the poisonous substance readily available? Or did the child go get it? I would have liked to know the ages of those children. Were they able to get into a closed container? In my experience at the Duke Poison Control Center, we always asked "How did it happen?" During the past several years, we averaged more than 55,000 calls annually. I would estimate that 75% of the children never had to go far, open anything, or do much—the potential poison was just there.

Overall, I would emphasize the need for doctors to persist. We need to persevere, and to educate, educate, educate.

Dr. Osterhout is Assistant Professor Emeritus, Duke Children's Primary Care, and a Journal *manuscript reviewer.*

"A Bunch of the Boys Were Whooping it Up"

Echinacea For What Ails Ya

Ronald B. Mack, MD

When World War II ended and massive demobilization occurred, many of us took advantage of the "GI bill" to obtain an entirely cost-free college education. I enrolled at Loyola University, an all-male institution, and joined a large group of fellow veterans who signed up as "premed" students. Many of us wore parts of our uniforms to class because the monthly stipend did not cover shopping at Brooks Brothers. I wore my deck jacket and Navy shoes till they fell apart.

One of our young classmates owned a tavern—the Club Alibi—located near the Chicago Cub's ballpark. This was our hangout; beer was cheap, but the camaraderie was rich. It was expected that each of us, while in attendance, would perform an act of entertainment: play the piano, sing, tell jokes or, in my case, recite poetry. This was not the type of beer joint whose crowd would be especially receptive to Keats or Shelley, so I recited the very "macho" poetry of Robert Service, while standing on top of a table.

Robert Service[1] was a war correspondent and ambulance driver during World War I, but his great popularity arose from his narrative verses about the Klondike gold rush and the rugged life in the Yukon at the end of the gold rush. He lacked the sophistication of other famous early 20th-century poets, but his narrative rhythm and his romantic-heroic attitude were very expressive. Generations since have memorized ballads like the "Cremation of Sam McGee" and "The Shooting of Dan McGrew" (my personal favorite and the one poem whose rendition I can still attempt, under the proper conditions). The Yukon was so cold that these miners must have had frequent respiratory illnesses. Do you think they took echinacea as a remedy?

An American Remedy

Echinacea is a very popular herbal remedy today; visit any health food store or appropriate section of a pharmacy to see the plethora of products under this name. In the early part of this century it was one of America's most popular plant drugs.[2] It was then that Native Americans made this plant their favorite floral remedy. They used it to treat snakebite and insect bites. They used the juice to treat burns and (purportedly) to walk on or swallow hot coals and fire during ritual purification ceremonies. These same early Americans used echinacea mouthwash[3] to treat painful teeth and gums, and a tea made from the herb to treat "colds, rubella, mumps, and arthritis. After 1930[3] echinacea was used almost exclusively by Europeans, but it is again becoming very popular in this country.

Echinacea also is known as the purple coneflower or Indian Head or snakeroot. It is native to the midwestern United States, but of course, is readily available in packaged form in health food stores throughout the country. Growing the plant in your own garden is an option. It is hardy and will grow in ordinary garden soil but more readily in soil treated with both compost and rock phosphate in the springtime.[2] Do not plant the seeds until the air temperature is 70° F. Remember when you harvest your horticultural adventure, the roots are what you need for herbal remedy purposes. This pretty-to-look-at perennial resembles a black-eyed Susan (I was reared in an inner city and the only Susan in our 'hood had one blue eye and one brown eye) and is covered with tiny bristly hairs (so was she). Its roots were long and black (as were hers, even though she allegedly had blonde hair).

Good For What Ails Ya?

Echinacea contains approximately 0.1% of a caffeic glycoside known as echinacoside. It also has a very pungent component

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called echinacein, a complex isobutylamide which is very toxic to adult houseflies.[4] Even as we speak, this plant and its extracts are being used topically for wound-healing purposes and internally to stimulate the immune system.

> "Probably the most fascinating activity of echinacea...is its ability to enhance the immune response."

Probably the most fascinating activity of echinacea, from the point of view of clinicians, is its ability (via its extracts) to enhance the immune response.[5] Studies suggest that a lipophilic portion of the root and leaves contain the most potent immunostimulating components, but the exact compound that can do this has yet to identified.[5] Apparently, echinacea extracts stimulate phagocytosis, increase cellular respiration, and increase the mobility of leukocytes. These studies are exciting, but much too preliminary for us (who believe in the scientific method) to draw conclusions about the therapeutic role of echinacea extracts. To date, there are no well-controlled studies that document and evaluate the effects of echinacea supplements; as a result, proper doses are not well defined.

As I stated previously, this herb is a highly touted commodity; a recent *Wall Street Journal* article[6] pointed out that echinacea's "purported benefit" in preventing the common cold, led to US sales of more than $22 million in 1997. True believers espouse the theory that it behaves like interferon.[3] They note that before a virus-infected cell dies, it releases small amounts of interferon, which allegedly increases the ability of surrounding cells to resist infection. They believe that echinacea may perform a similar function, but other proponents say it directly kills a broad range of disease-causing viruses, fungi, bacteria, and protozoa.[3] They claim that the herb contains a natural antibiotic ("echinoside"), which is supposed to be similar to penicillin. Some studies from the University of Munich show that echinacea extract increased production of T-cells up to 30% more than other immune-boosting drugs.

One interesting biochemical aspects of echinacea is its ability to inhibit the activity of the enzyme hyaluronidase.[7] This enzyme, when activated, destroys the integrity of tissue-ground substance, a barrier against pathogenic organisms. Some pathogenic bacteria can activate hyaluronidase, thereby destroying the integrity of the ground substance and allowing the pathogens to invade, attach themselves to exposed cells, penetrate the membrane and ultimately kill the cells. Echinacea supposedly inhibits the action of hyaluronidase by bonding with it and thus, at least temporarily, preserving the integrity of the barrier.

Not much is known about the toxicity of this plant. No reports of toxicity have been forthcoming, according to Poisindex,[4,8] the computer database that tracks data on poisoning. The lack of reported problems is quite remarkable considering the plant's documented use in this country for over 100 years. The new *Botanical Safety Handbook* of the American Herbal Products Association lists echinacea as Class I (can be safely consumed when used appropriately).[9] However, no one recommends that this plant be used for systemic diseases such as tuberculosis, AIDS, HIV, or autoimmune diseases.

I have no argument with taking this herbal remedy unless so doing deters the user from seeking appropriate medical care for conditions that are not self-limited. Preparations can be purchased prepackaged, often combined with goldenseal or vitamin C. Echinacea seems to be especially popular for preventing and treating viral upper respiratory infections. I had an English professor in college who treated his "cold" symptoms by putting a beaker of Jack Daniels in his right hand and two aspirins in his left hand. He then threw the aspirin over his left shoulder and the bourbon down his throat.

> "The lack of reported problems is quite remarkable considering the plant's use in this country for over 100 years."

Back to the Klondike

On some good days—if someone helps me up to the top of a table—I can still recite:

"A bunch of the boys were whooping it up in the Malamute saloon,
The kid that handles the music-box was hitting a jag-time tune;
Back of the bar, in a solo game, sat Dangerous Dan McGrew,
And watching his luck was his light-o'-love, that lady that's known as Lou..."

...provided my echinacea level or whatever, is high enough. ❑

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A "Liver Test" Is Not a Liver Test

Measuring Serum Creatine Kinase Can Identify Muscular Dystrophy and Avoid Liver Biopsy

Richard W. Tim, MD, Pete Gaskell, PAC, and Jeffrey Stajich, PAC

Liver cells contain large amounts of alanine (ALT) and aspartate (AST) aminotransaminase, and destruction of liver cells can release these enzymes into the circulation. Because of this, measurements of the serum levels of AST and ALT are often spoken of as "liver function tests." The evaluation of liver disease detected by finding elevated serum levels of these transaminases may necessitate percutaneous needle biopsy of the liver.[1] This can be an invaluable procedure, and is relatively safe but does have a complication rate of around 0.3% and deaths have been reported.[2,3]

In reviewing the histories of all patients seen in the Duke Muscular Dystrophy Association Clinic since 1990, we found five whose prior evaluation for persistently elevated serum AST and ALT led to percutaneous biopsy of histologically normal livers. In each case, after liver biopsy was unrevealing, nonhepatic sources of the elevated serum transaminases were sought, and elevated serum levels of creatine kinase (CK) led to the diagnosis of a muscular dystrophy in all.

Others have had similar experiences, finding elevated transaminase levels that were subsequently found to be related to a myopathy.[4-9] It is important to obtain CK measurements *before liver biopsy* in all patients who have elevated transaminases but no other evidence of hepatic disease. Otherwise, one may advise an unnecessary, expensive, and sometimes dangerous procedure.

Our Patients

Patient 1, male, was seen at age 9 months for decreased appetite. A serum chemistry panel revealed elevated AST, ALT, and lactate dehydrogenase (LDH) levels (Table, next page). He was the product of a normal gestation and delivery, and his early developmental milestones were said to be normal. There was no history of abdominal trauma or jaundice, but he was taking trimethoprim/sulfamethoxazole for otitis media.

The antibiotic was discontinued, but transaminase levels remained elevated over the next 8 months. His appetite returned, and he developed and grew normally. At the age of 17 months, he underwent needle biopsy of his liver. Liver histology was normal, but serum AST and ALT levels remained persistently elevated over the ensuing 3 years. When a urine dipstick test was reported as "positive for blood," evaluation led to discovery of a markedly elevated serum CK level. Only then was the patient's mild proximal muscle weakness noted; he needed to use his arms to "walk up" his legs when trying to arise from a prone position (Gower's sign). Studies on a blood sample showed a deletion in exon 45 of the dystrophin gene, and confirmed the clinical diagnosis of Duchenne dystrophy.

Patient 2, male, was the product of a normal gestation and delivery. The child's mother had been unaware of any problems, but a pre-kindergarten physical examination at age 5 documented height and weight below the 5th percentile. He was evaluated for "failure to thrive"; a chemistry panel demonstrated elevated AST, ALT, and LDH levels (Table). Liver disease was suspected, and he was referred to an academic institution. Prothrombin time, and tests for hepatitis A and B, α-1 antitrypsin deficiency, and Wilson's disease were normal. A liver biopsy was normal.

During a search for nonhepatic causes of the elevated serum transaminases, a markedly elevated serum CK level was found (Table). Physical examination demonstrated mild proximal muscle weakness, difficulty arising from the floor, tight-

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Table. Serum chemistries in five patients (normal values in parentheses)

Patient	Age at onset	AST IU/L (<45IU/L)	ALT IU/L (<45 IU/L)	LDH IU/L (<200 IU/L)	T.Bili mg/dL (<1.4 mg/dL)	CK U/L (<200 U/L)
1	10 months	520	406	984	0.6	18900*
2	5 years	562	667	2408	0.8	37700
3	18 years	199	205	1123	0.6	2241
4	31 years	171	230	803	0.5	4533
5	4.5 years	655	675	—	0.4	26000†

* serum CK in patient 1 drawn at age 4
† serum CK in patient 5 drawn at age 6
AST—aspartate aminotransferase
ALT—alanine aminotransferase
LDH—lactate dehydrogenase
T.Bili—total bilirubin
CK—creatine kinase

ened heel cords, and enlarged calves. A blood study demonstrated deletions of exons 47 through 51 in the dystrophin gene.

Patient 3, an 18-year-old male, had no significant prior medical history. He was an active bicyclist and surfer, and denied muscle cramps, myalgias, or episodes of dark-colored urine. During evaluation of a possible reactive depression, a chemistry panel demonstrated elevated transaminases (Table). Assays for α-1 antitrypsin, ceruloplasmin, gamma-glutaryl transferase, and antibodies and antigens related to hepatitis A and B were normal. A needle liver biopsy was also normal.

Nonhepatic sources were then considered, and CK levels were found to be elevated. Physical examination detected very mild proximal muscle weakness, and calf muscles that were enlarged relative to the anterior thigh muscles. A quadriceps muscle biopsy showed nonspecific myopathic changes, without inflammation. Quantitative and qualitative assays showed low levels and a decreased molecular weight of muscle dystrophin, consistent with Becker muscular dystrophy.

Patient 4, a 36-year-old male, had undergone liver biopsy at age 14 because of "abnormal liver function tests" discovered on routine blood work. Liver histology was reported as normal, but no other information was available from that period. At age 31, elevated transaminases (Table) were found on a chemistry panel performed during an episode of upper respiratory infection. Serum ceruloplasmin and ferritin levels, and serological tests for hepatitis A, B, and C were normal. The transaminsases were monitored for a year. A second liver biopsy was normal once again.

Nonhepatic sources of the elevated transaminases were then considered, and the serum CK found to be markedly elevated. He complained of mild weakness in his legs over the preceding year, but he was felt to have full power on examination, and a needle electromyogram (EMG) was said to be normal. During the next 5 years, he noted gradually progressive proximal leg and arm weakness. By age 36, he had definite scapular winging, and mild proximal leg and arm weakness. A repeat EMG demonstrated a myopathy. It was then discovered that the patient's sister had developed a symptomatic myopathy at age 26, 14 years before the patient's diagnosis of a limb-girdle muscular dystrophy.

Patient 5, a 6-year-old male, was the product of a normal gestation and delivery. At the age of 18 months, Crohn's disease had been diagnosed after a barium study done to evaluate persistent vomiting since the age of 3 months. Sulfasalazine was started, and a few months later oral glucocorticoids were added. He remained on combination therapy for 3 years despite never having persistent diarrhea or bloody stools. He did have several hospital admissions for vomiting and abdominal distension. Elevated serum transaminases were documented at age 4.5 years (Table). We do not know whether serum transaminases had been measured before that time because his previous medical records are not available. Blood counts, erythrocyte sedimentation rate, and immunoglobulin profile were normal.

He was followed for 18 months at an academic institution. AST and ALT remained elevated, and he complained of feeling tired all of the time. At age 6, he underwent percutaneous liver biopsy, which was normal. In searching for an alternative explanation of the elevated transaminsases, his CK was found to be 26000. Clinical examination showed mild truncal and proximal weakness, with a partial Gower's sign. Study of a blood specimen demonstrated deletions of exons 49 through 52 of the dystrophin gene, confirming the clinical diagnosis of Duchenne muscular dystrophy.

The Interpretation of Serum Enzyme Levels

Doctors are often asked to evaluate "asymptomatic" elevations of the serum transaminases. Since textbooks[1] teach that transaminase levels over 400 IU/L indicate "hepatocellular injury," doctors often assume that the liver is the source of these enzymes and to gear the work-up to look for specific hepatic disorders, but nonhepatic tissues contain varying amounts of transaminases. Expressing tissue levels relative to serum as unity, liver AST activity is 7100, and ALT activity is 2850; skeletal muscle AST activity is 5000, and ALT activity is 300.[10] In hepatic disease, levels of both enzymes are elevated, but AST is usually higher than ALT (although exceptions are common). Because there is relatively little ALT activity in skeletal muscle, most myopathies do not show high serum levels of ALT; however, with sufficient muscle injury or membrane leakage, serum ALT can be elevated.

Patients with Duchenne and Becker muscular dystrophy typically have very high elevations of serum CK, and day-to-day variations in the serum CK levels parallel the rises and falls in AST and ALT levels.[11] In contrast to Duchenne and Becker dystrophy, other inherited or acquired myopathies are not often characterized by markedly high serum CK levels and usually do not have elevations of serum AST or ALT.

"Duchenne and Becker muscular dystrophy patients have high serum creatine kinase levels."

The Muscular Dystrophies

The muscular dystrophies are a heterogeneous group of inherited primary myopathies. An early and accurate diagnosis is important to both the patient and other family members. Knowing that there is a risk of an inherited disorder may affect family planning by the parents of the patient and other at-risk family members.

Duchenne muscular dystrophy is an X-linked disorder caused by the primary absence of an intracellular structural protein, dystrophin. It has an incidence of about 1 in 3500 male births, and is one of the most severe muscular dystrophies.[12] Affected boys usually appear normal at birth, and pass early developmental milestones normally. One can often elicit a history of clumsiness as a toddler, and weakness can sometimes be detected on careful examination before age 3, but the disease is usually recognized between ages 3-5 when the child has trouble climbing stairs or running. The weakness most prominently involves the hip flexors, knee extensors, ankle dorsiflexors, and shoulder abductors and other proximal arm muscles. The calf muscles may appear enlarged due to replacement with fibrous or adipose tissue (pseudohypertrophy). Transaminases may be elevated, but the serum CK level is typically 50 to 100 times normal.[12] In contrast to the acquired inflammatory myopathies, and even though there is marked elevation in serum CK, muscle strength can be normal early in the course of Duchenne dystrophy. The weakness progresses so that most patients are wheelchair-bound by age 12, certainly by age 16. Death (from respiratory failure or a dilated cardiomyopathy) usually occurs in the late teens to mid-20s.

Becker muscular dystrophy is also caused by an abnormality in dystrophin. In Becker dystrophy, dystrophin is present in reduced amounts or has an abnormal molecular weight or function.[13] The clinical severity of Becker dystrophy varies considerably, depending on how much functional dystrophin is present. Duchenne and Becker dystrophy represent manifestations of a single disease process (dystrophinopathy). Duchenne dystrophy is the more severe and stereotyped form; Becker dystrophy tends to be less severe and have a later age of onset (from as early as the latter half of the first decade of life to the fourth or fifth decade). As a rule, the earlier the clinical presentation, the more severe the disease. Even before symptoms develop, CK levels are elevated in Becker dystrophy, although not to the extreme levels seen in Duchenne dystrophy.

In general, gene study cannot reliably distinguish Becker from Duchenne dystrophy. The distinction is usually made on clinical criteria: age of presentation, ability to walk, and disease severity. By arbitrary definition, a patient with a dystrophinopathy who can walk after age 16 has Becker dystrophy. Quantitation of dystrophin by muscle biopsy may help distinguish Duchenne from Becker dystrophy, but the results should be judged in the context of clinical severity.

Some muscular dystrophies, such as autosomal dominant facioscapulohumeral (FSH) muscular dystrophy, may not have elevated serum levels of CK. There is no available molecular or genetic test for FSH dystrophy. On the other hand, most of the limb-girdle (LG) dystrophies do have elevated levels of CK. The LG dystrophies can be autosomal dominant or recessive. Some are fatal, particularly the early onset, autosomal recessive forms. The LG dystrophies can mimic Duchenne dystrophy, but equally affect males and females. Diagnosis can sometimes be confirmed on muscle biopsy specimens sent to specialized laboratories.

"Consideration of nonhepatic sources (of serum transaminases) may be fleeting, depending on the clinical situation."

Evaluating Transaminasemia

In 19 patients reported elsewhere,[4-9] elevated transaminase levels were found during evaluation for problems unrelated to muscle symptoms. Of interest, one patient had a spinal muscular atrophy (SMA) not a myopathy.[5] SMA is a degenerative disease of anterior horn cells of the spinal cord. Elevated serum CK due to secondary degeneration of muscle fibers can be seen in SMA and also in amyotrophic lateral sclerosis. At the time of initial evaluation, at least 5 of the previously reported patients had no clinical features of muscle disease, but all 19 had significantly elevated CK levels. In 3 of the 5 patients with elevated transaminases we report here (patients 2, 3, and 5), myopathy probably could have been diagnosed by a careful and focused history and physical examination. Patients 1 and 4 were probably presymptomatic. The correct diagnosis of a muscular dystrophy was made in Patient 1 after an abnormal urine dipstick reading indicated "hematuria" (probably myoglobinuria).

The liver is not the only potential source of serum transaminases, but it is probably no exaggeration to say that most physicians initially think of elevated AST and ALT levels as "signs of liver disease." Consideration of nonhepatic sources may be fleeting, depending on the clinical situation. In part, our thoughts are influenced by the way in which blood chemistry panels are packaged, marketed, labeled, and subsequently ordered. Screening serum chemistry panels are cheaper than multiple individual tests, and are ordered in a wide range of clinical situations. AST and ALT levels *are* used to monitor or diagnose liver disease, often bundled with tests for alkaline phosphatase, bilirubin, and lactate dehydrogenase. We all speak casually of ordering a "liver panel," "liver function tests," a "GI panel," or a "Chem 18." These panel names reflect their common usage, but the very names themselves may partially or temporarily blind us to the possibility of nonhepatic sources of the serum enzymes.

Elevated transaminase levels may be detected serendipitously on chemistry panels ordered as a screen of general health patients without suspected muscle or liver disease. Screening panels do not usually include a serum CK; inclusion would alert clinicians to those rare patients whose serum transaminases arise from a myopathic source, but this is unnecessary and wasteful of limited economic resources. But the ordering clinician must always consider a nonhepatic source of elevated serum transaminases, especially when there is no other evidence (such as hyperbilirubinemia) of liver disease. Our 5 patients make it clear what can happen when nonhepatic sources are not considered.

We advocate the following approach to the evaluation of elevated serum transaminases: 1) a careful history (including family history) with particular attention to medications (prescription and over-the-counter) that might cause cholestasis or hepatic dysfunction, alcohol use, chemical exposure, and travel history; 2) a physical examination carefully assessing the abdomen and liver, looking for cutaneous spider angiomas, and testing the muscle strength of the patient (recognizing, as demonstrated by at least 2 of our patients, that muscular dystrophy patients may not be weak early in the course of their disease); 3) laboratory testing to help establish the presence of hepatic disease. An elevated serum bilirubin level or clinical jaundice supports the diagnosis of a hepatic abnormality. Other pertinent studies include serum antibody tests for hepatitis viruses A, B, and C; serum ferritin, iron, and total iron binding capacity for hemochromatosis; ceruloplasmin for Wilson's disease; fluorescent antinuclear antibodies for autoimmune inflammatory hepatitis; and antimitochondrial antibodies for primary biliary cirrhosis. Patient age, general health, known neoplastic diseases, and family history will determine which studies are indicated.

Whenever weakness is found on clinical examination, a serum CK should be measured. Of course, the only measurable marker of liver disease in some patients will be elevated serum AST and ALT, and some patients with myopathy may have unrelated hepatic dysfunction (elevated bilirubin, alkaline phosphatase). Percutaneous liver biopsy may help establish specific hepatic pathology in such patients. But in all patients who have no other markers of hepatic disease, we advocate measuring the serum CK *before* the liver biopsy. Serum CK should probably be measured early in the work-up of very young children or infants, particularly boys who otherwise appear healthy. Measurement of serum CK levels and careful physical examination can lead to an earlier diagnosis of muscular dystrophy, and avoid needless liver biopsy in the small group of patients with a primary myopathy instead of a hepatic disorder. Clinicians who order tests must always consider what the tests are designed to measure and interpret the results accordingly. ☐

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See Commentary, next page

Commentary

Danger! Caution! Beware! Words at Work!

Francis A. Neelon, MD, Journal Editor

We all use words that mean more than they say. Sarcasm, innuendo, double entendre all convey more than one message at once. The magic of metaphor, the power and depth of fine literature, the play of puns all rely on words that bear more than a literal or singular meaning.

We all recognize the political significance of word choice: how the wrong word at the wrong time can derail a political career, or how prose that appeals to voters can carry a lesser candidate to victory, or the way that demagogues and dictators invariably call themselves "democrats." George Orwell's essay, "Politics and the English Language," and his *Animal Farm* and *1984*, make clear the role of language in regimentation.

Perhaps less openly acknowledged is how words serve self-definition—look at the demise of the American "Indian," or the relegation of "Negro" to the verbal scrap heap. In medicine we struggle over whether "Down's syndrome" is better than "Down syndrome," or whether we should refer to people with diabetes as "diabetics." Members of those groups are rightly leery of being lumped into a prejudged class; they want to avoid letting words constrain thinking, their own and others'.

But there is still another way in which words and thinking are connected. Orwell told us in his essay[1] that just as thought can corrupt language, so language can corrupt thought. The notion that words not only result from thought, but that they actually shape and constrain thought was championed by a remarkable amateur American linguist named Benjamin Lee Whorf. Whorf, a 1918 chemical engineering graduate of MIT, worked as fire inspector for the Hartford Fire Insurance Company. As Whorf recounts,[2] employees who carefully avoided smoking around containers of flammable liquid gasoline, did smoke in the presence of "empty" drums. Although empty of liquid, they were full of explosive (and even more dangerous) vapors. Using the word "empty," Whorf reasoned, blinded them to danger. The word itself changed the way they thought. He collected a number of other instances in which the use of words so changed behavior that disaster resulted.

By comparing the language of the Hopi Indians to American English, Whorf documented how word use and vocabulary and grammar alter our very perception of reality. Ideas as fundamental as time and space differ markedly, depending on the language used to express (and think about) them. This idea (the Sapir-Whorf hypothesis) is lately out of favor among linguists, but it has the ring of common sense about it. How else can we explain the observations of Tim and colleagues that abnormal results on what we commonly refer to as a "liver function test" led to painful and dangerous liver biopsies—procedures that could have been avoided in each case if we had only called the test by another name (say simply, "serum transaminases"), a name that did not carry the implication of etiology.

The words we use bend our thoughts and our actions. Those thoughts and those actions have far-reaching consequences for our patients. It is always important to recognize what we are saying, and why we are saying it, and what saying it makes us do (or not do). You know what I mean. ❑

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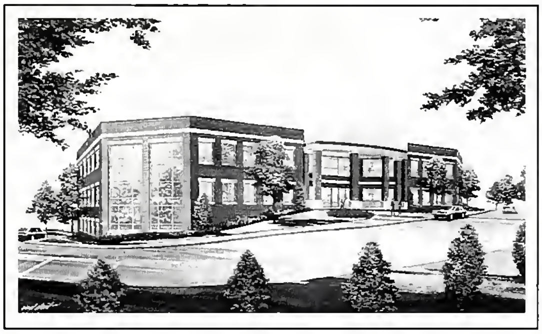

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Tumescent Liposuction
Fat Removal for Medical and Cosmetic Purposes

Elizabeth F. Rostan, MD, Shabnam Madani, MD, and Robert E. Clark, MD, PhD

Fat removal via liposuction surgery began in the United States in the early 1980s. Currently, it is the most commonly performed cosmetic procedure in this country.[1] In addition, is used in a number of noncosmetic procedures (Table, at right).

Since its introduction, a number of advances in both technique and equipment have made liposuction safer and more effective. Probably the most important innovation was the development of the tumescent technique of local anesthesia. Because of the popularity and widespread use of tumescent liposuction, we believe physicians should have a basic knowledge of how it is carried out, its uses and limitations, and its potential adverse effects.

Clinical applications of tumescent liposuction

- Aesthetic surgery
- Lipoma removal
    - —giant lipoma
    - —multiple lipoma syndromes
- Removal of "buffalo hump"
- Axillary hyperhidrosis
- Gynecomastia and pseudogynecomastia
- Breast reduction
- Undermining/defatting surgical repair flaps
- Evacuation of hematomas
- Removal of fat necrosis
- Congenital body asymmetry
- Lymphedema

Definition

Liposuction refers to the surgical disruption and removal of subcutaneous fat using a vacuum-assisted cannula. Common synonyms include suction-assisted lipectomy, lipoextraction, lipolysis aspiration, and lipodissection.[2]

Subcutaneous skin contains both a superficial and a deep layer of fatty tissue. The deep (but not the superficial) layer is thick and traversed by loose, widely spaced septa. This deep layer is most amenable to liposuction because it offers minimal resistance to dissection and removal of fat.[2]

Prior to the development of the tumescent technique, liposuction was usually done under general anesthesia.[3] The results were satisfactory, but both the general anesthesia and the procedure itself led to significant postoperative nausea, postural hypotension, severe bruising, pain, and significant blood loss.[4,5] In addition, there were case reports of fat embolism, pulmonary embolism, toxic shock syndrome, thrombophlebitis, even death after liposuction or liposuction and abdominoplasty performed under general anesthesia.[6-8] And operating room charges, the need for an anesthesiologist, overnight hospital stays (extended if there were complications) inflated the cost of the procedure.

Tumescent liposuction, first described by dermatologic surgeon Jeffrey Klein in 1986, refers to liposuction performed after local anesthesia of the area of treatment using large volumes of subcutaneously injected dilute anesthetic solution. This produces firmness and swelling ("tumescence")[3] and adequate anesthesia of the skin and subcutaneous tissues to allow liposuction without the use of general anesthesia. The procedure can be performed on outpatients, avoiding the risks and costs inherent in the use of general or intravenous anesthesia.

Patient Selection and Evaluation

The success of liposuction (Figure 1, next page) depends on proper patient selection, using both physical and psychological examination. The skin exam focuses on tone and elasticity because patients with good skin tone and elasticity have better

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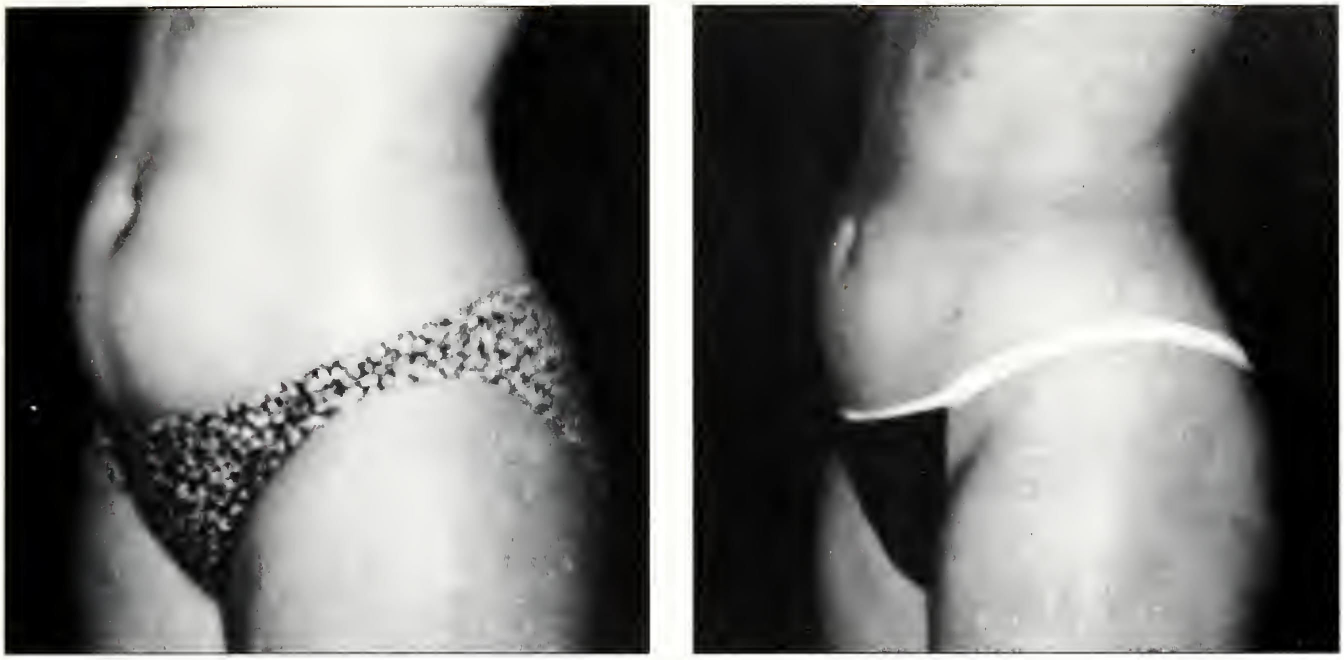

Fig 1: (left) Preoperative photograph of abdominal tumescent liposuction patient; (right) same patient, four months after treatment.

results. Sun-damaged skin, which has lost elasticity, and skin with numerous stria does not conform well to the new contours created by liposuction.[9,10] Areas of skin dimpling and cellulite are noted because these problems will not be corrected by liposuction. Abdominal or inguinal hernias are not absolute contraindications but must be thoroughly evaluated before proceeding.[9]

During the psychological assessment, patients' motives and expectations must be explored. Liposuction is no cure for obesity. The procedure is best used for body contouring in slightly overweight individuals or those with disproportionate areas of fat. Expectations must be realistic; it is important for patients to understand that liposuction is not a substitute for a healthy diet and regular exercise.

A thorough medical history, emphasizing past surgeries and complications, chronic medical problems, and current medications, is obtained during the preoperative evaluation. The extent of preoperative laboratory evaluation is a matter of physician judgment, but we recommend complete blood counts including platelet count, clotting studies, and beta HCG pregnancy test in women of childbearing potential. Blood chemistry profiles are obtained if indicated by patient's health status, but may not be necessary in healthy patients undergoing limited fat removal.[11]

Technique

The anesthetic solution consists of normal saline containing lidocaine at a concentration of 0.05%-0.1% and epinephrine at 1:1 million dilution. Approximately 12.5 cc of 8.5% sodium bicarbonate is added per liter of solution to reduce acidity and thereby diminish burning and stinging on injection.[3,5] The solution is warmed before injection to prevent a drop in the patient's body temperature.[4]

A small stab incision is made in the skin and the tumescent injection needle inserted into the subcutaneous plane. These needles come in various lengths and diameters, but all have a blunt tip to facilitate movement through the deep adipose layer while minimally disrupting fibrous septa and blood vessels. Anesthetic solution is injected until the entire area to be treated is swollen and slightly to moderately distended, or tumescent.[3]

After anesthesia is satisfactory, fat is suctioned through 2.0 mm-4.0 mm diameter, blunt-tipped cannulas (Figure 2). When the procedure is complete, the stab incision is left unsutured to provide drainage of the tumescent fluid.[3,5] The treated area is bandaged and the patient is placed in elastic support garments. Patients are discharged home immediately after the procedure and are encouraged to walk on the evening of surgery. Local anesthetic effects last approximately 10-16 hours after tumescent liposuction,[3,12] but if subsequent pain relief is needed, acetaminophen or acetaminophen with codeine is given. The elastic garments are worn for 3-14 days postoperatively depending on the area treated.

Advantages of Tumescent Technique

Several authors have reported high patient satisfaction with tumescent liposuction, particularly in patients who had undergone previous conventional liposuction.[3,5,12] Pain during and after the procedure is minimal, and patients rapidly return to normal daily functions.

Prior to the development of the tumescent technique, blood loss during liposuction was a significant problem, especially when more than 1500 mL of fat was aspirated. The "dry" technique uses no local injections and is performed with large cannulas under general anesthesia. A study of 108 patients who underwent liposuction of more than 1500 mL via the "dry" technique showed that approximately one-third of the aspirated material was blood. Every patient in this study received blood transfusion, illustrating the significant blood loss associated with the "dry" technique.[13]

Several studies have demonstrated a hemostatic effect from tumescent liposuction. Klein reported on 112 patients who underwent tumescent liposuction of 1500 mL or more of fat. Blood accounted for about 1% of the suctioned material (average blood loss was 18.5 mL),[13] and others have reported similar results.[14] Because blood loss is minimal, tumescent liposuction produces very little postoperative bruising; there is no need for transfusion; postoperative recovery is rapid, and patients are able to return to light work a few days after surgery.[3]

"Dry" liposuction of large volumes of fat produces massive fluid shifts and third space sequestration. The resultant orthostatic hypotension and hypovolemia require careful hemodynamic monitoring and large amounts of intravenous fluid replacement.[5,14] With the tumescent technique, systemic absorption of the subcutaneously injected fluid—a process known as hypodermoclysis—provides adequate fluid replacement. Minimal or no intravenous fluid is needed, and there is usually no hypotension or tachycardia.[4,5,13,14]

The smaller cannulas used during tumescent liposuction produce less trauma to the subcutaneous tissue, more uniform and complete removal of fat, smaller incisions, accelerated healing, and better cosmetic results.[4] In addition, because tumescent liposuction is performed with the patient awake and alert, the patient can cooperate, even stand at the end of surgery to assess symmetry of the treated area. Most importantly, however, the risks inherent in the use of general anesthesia (such as nausea, vomiting, hypotension, hypoxemia, cardiac arrhythmias, even death) are avoided.[3]

Noncosmetic Applications of Tumescent Liposuction

Since its introduction, liposuction has been used for a number of cutaneous disorders (Table). Probably the most common application has been the removal of lipomas. Liposuction has a number of advantages over conventional excision for lipoma removal: 1) smaller (< 1 cm) and fewer scars (because multiple lipomas often can be removed through one incision); 2) decreased postoperative pain; and 3) lower risk of infection or wound healing problems.[16,17] Liposuction has been used to treat the cervical fat pad, or "buffalo hump," seen in Cushing's syndrome.[17]

Liposuction is effective in the treatment of gynecomastia and pseudogynecomastia. It avoids the large scars, hematomas and blood loss, nipple or skin necrosis, and nipple inversion associated with traditional excisional surgery.[16-18] Liposuction has been used for breast reduction surgery in women.[17]

Liposuction offers a new and effective technique for treating axillary hyperhidrosis.[16,17] Traditional debulking surgery of the central axillary skin and subcutis leads to painful recovery periods and large scars. Liposuction can disrupt and remove eccrine glands and create inflammation and fibrosis that further destroys glands.

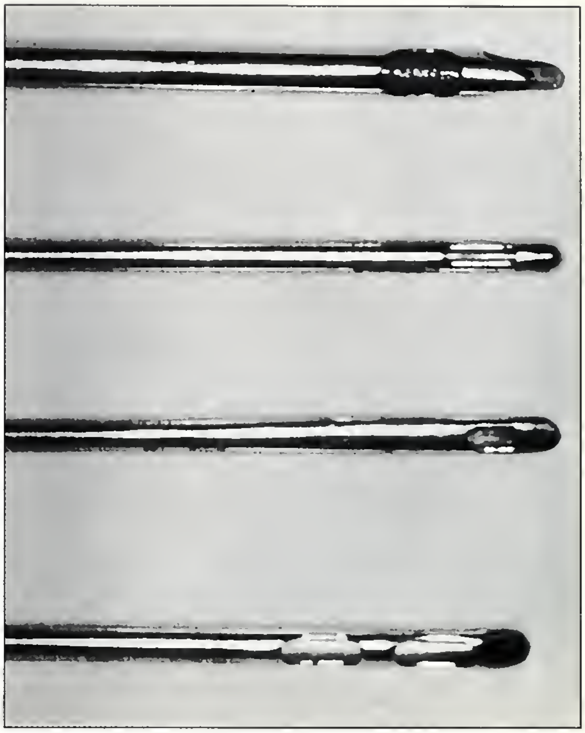

Fig 2: Cannulas of varying size and shape used to suction subcutaneous fat deposits.

Complications

Tumescent liposuction has a remarkably low rate of complications. A recent survey of dermatologic surgeons accumulated observations on 15,336 patients who had undergone tumescent liposuction. The rate of serious complications was exceptionally low or absent. There were no instances of pulmonary or fat emboli, hypovolemic shock, perforated abdominal or thoracic cavity, thrombophlebitis, or death. No blood transfusions were used and no hospital admissions were required for treatment of complications.[19]

The most frequently reported complication was transient scrotal or labial edema or ecchymosis, occurring in 0.4% of patients. Infection was the second most frequently reported complication, occurring in 0.3% of patients. Permanent skin irregularity (dimpling or retraction) was reported in 0.26% of the patients. There were five reported instances of permanent sensory nerve deficit in a treated area. Other complications, found in less than 0.05% of patients, included: persistent postoperative pain, permanent pigment alteration, excessive or prolonged bruising, unacceptable scars, and skin ulceration or necrosis.

Conclusion

Tumescent liposuction is a safe and effective way to remove fat for both cosmetic and medical purposes. The tumescent technique allows liposuction to be performed under local anesthesia, thus avoiding the risks inherent with the use of general anesthesia. We suspect that tumescent anesthesia eventually will prove to be a safe and effective technique for many other surgical procedures. ❑

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A Hemodialysis Patient with Chloramine-Induced Hemolysis

A Discussion of the Mechanism

A. Craig Lockhart, MD

Trihalomethanes (THMs) such as chloroform, bromodichloromethane and chlorodibromomethane are thought to be carcinogenic[1] and teratogenic.[2] In 1979, the Environmental Protection Agency limited the amount of THMs that can be contained in public drinking water. As a result, sanitization of public water supplies relies on chloramines instead of free chlorine. Chloramination, which results from the combination of chlorine and ammonia in aqueous solution, avoids the chlorination of organic hydrocarbon residues that produces THMs. In addition to reducing the formation of THMs, chloramines are more stable than free chlorine, and therefore maintain antimicrobial activity longer and at lower concentrations than free chlorine.[3]

Because chloramines are oxidant compounds, they can injure erythrocytes if blood is exposed to them. Patients undergoing hemodialysis with water that is rich in chloramines can suffer such chloramine injury to their erythrocytes.[4] The erythrocyte injury varies from methemoglobin formation to frank hemolytic anemia. Careful observation of standards for water treatment at dialysis centers has made chloramine-induced hemolysis unusual, but sporadic outbreaks still occur (Minneapolis 1970,[4] Madrid 1974,[5] Sydney 1981,[6] Los Angeles 1984,[7] Philadelphia 1987,[8] and Seoul 1989[9]). Vigilant testing for chloramines makes these incidents unusual at dialysis centers, but the availability of home dialysis means that isolated cases of dialysis-induced hemolysis are becoming more common. I report here a case of hemolysis due to chloramine exposure in a patient undergoing home hemodialysis, and I discuss the mechanism by which chloramine induces hemolysis.

The Patient

A 43-year-old African-American man with end-stage renal disease due to focal segmental glomerular nephritis had been on hemodialysis since January 1997, and on home dialysis since August 1997. The patient had been doing well at home until he came to the Durham VA Medical Center because he had been "feeling poorly" for four days. Just prior to admission he had undergone home dialysis, following which he noted fever, chills, low back pain, and dark urine. In the emergency department, the patient was markedly anemic (hemoglobin = 7.4 g/dL), and had orthostatic hypotension.

He was admitted for transfusion, antibiotics, and fluid resuscitation. His admission symptoms resolved despite further dialysis as an inpatient, and he was discharged only to be readmitted two weeks later after he noted lethargy and fatigue during exertion. He also reported low-grade fevers and dark urine after each of his dialysis treatments at home.

Physical examination revealed pale mucous membranes, tachycardia, guaiac negative stool, and a functioning arteriovenous fistula. Lab evaluation showed a hemoglobin of 5.3 g/dL, a bilirubin of 2.1 mg/dL, a serum lactate dehydrogenase (LDH) of 782 IU, and a reticulocyte count of 10.2%. Peripheral smear showed marked anisocytosis, poikilocytosis, and polychromasia. No schistocytes were seen.

He was again transfused and had dialysis. He had no further symptoms. It was presumed that his hemolysis symptoms were related to the home dialyzer. The water supply at his home was tested by colorimetric assay and was shown to have 4+ total chlorine, but only trace-free chlorine, suggesting the presence of chloramines. A granular activated charcoal filter was added to the patients water circuit. He has done well since then, without further evidence of hemolysis.

Discussion

Anemia is common in patients on hemodialysis. The anemia may be due to decreased erythropoetin production or due to the decreased red cell survival in patients who are uremic. Red cell survival can also be decreased in patients on dialysis, but well-

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dialyzed patients have a fairly normal erythrocyte life span.[10] The primary factors affecting red cell survival in these patients are mechanical trauma and oxidative stress.[11] Oxidative stress is poorly tolerated by the red blood cells of dialysis patients due to reduced antioxidant capabilities in the cells.[12]

Antioxidant systems are compromised in hemodialysis patients because of impairment of the hexose monophosphate shunt (HMPS),[13] reduced levels of glutathione,[14] and decreased activity of the enzymes catalase, glutathione peroxidase, and superoxide dismutase.[15] It has been proposed that the reduction of antioxidant defense mechanisms in erythrocyte membranes results in peroxidation of membrane lipids and thereby in decreased cation permeability and membrane pliability.[16] Reduced membrane deformability may increase the likelihood of hemolysis in these patients.

As noted earlier, chloramines are oxidant compounds. When they come in contact with the red blood cells of dialysis patients that are already at risk for oxidant damage, erythrocyte injury can result. The mildest form of damage is methemoglobin formation. Methemoglobin is formed when one or more of the iron atoms in hemoglobin are oxidized, changing the conformation of hemoglobin and, hence, its oxygen affinity. Iron atom oxidation can be reduced by the enzyme methemoglobin reductase. However, repeated exposure to oxidants can be cumulative, and result in severe oxidative damage and precipitation of hemoglobin as Heinz bodies.[17] Persistent oxidative stress on the hemoglobin molecules, eventually leads to a change in the three-dimensional structure of hemoglobin so that it is less soluble and forms sulfhemoglobin, a hemachrome. Continued oxidative pressure leads to aggregation of the insoluble hemachromes into Heinz bodies.[18] Erythrocytes containing Heinz bodies are cleared from the blood by the spleen. The surface membranes of the red cells containing Heinz bodies are less deformable and easily damaged. In severe cases, hemolysis at the time of dialysis is evidenced by dark blood in the venous line of the dialyzer and acute distress of the patient.

In addition to direct oxidant damage to red cells, chloramines also inhibit repair of oxidant damage, specifically by inhibiting hexose monophosphate metabolism. The HMPS generates nicotinamide adenine dinucleotide phosphate (NADPH), a reducing agent that protects the red cell from oxidant damage.[4] As noted, the HMPS of erythrocytes is impaired in dialysis patients, and chloramines seem to further potentiate this problem. Patients with glucose-6-phosphate dehydrogenase deficiency have another, genetic defect in the HMPS pathway and are quite vulnerable to oxidative stress.

Chloramines are small and nonionic and are therefore not removed by water softeners or reverse osmosis. Some reduction is seen with deionization. Two methods of chloramine clearance are known to be effective: perfusion through granular activated charcoal (GAC), and chemical reduction by ascorbic acid. GAC works primarily by absorbing organic molecules, while ascorbic acid is a natural reducing agent.[3] Most dialysis centers employ one or both procedures, but chloramine levels can fluctuate widely even in a constant water supply, so rigorous testing is required. Some centers test daily; others require testing prior to each shift of patients. The problem is for patients on home dialysis where water testing is usually not as stringent.

Conclusion

Chloramines have caused outbreaks of hemolysis in dialysis patients. Red blood cells in dialysis patients are at risk for oxidant damage because of impaired cell antioxidant activity. Chloramines cause oxidant damage to erythrocytes resulting in methemoglobin formation and precipitation of hemoglobin as Heinz bodies. Chloramines can be reduced in dialysis water by using granular activated carbon or ascorbic acid. These measures are in place in dialysis centers, thus reducing the likelihood of widespread hemolysis. However, with home hemodialysis, sporadic, single-patient cases of dialysis-induced hemolysis do occur. Vigorous testing of the water supply to patients' homes is important. ❑

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Helping Patients Take Control of Their Medical Records

A Case Study of a Personal Health Organizer

Eric C. Westman, MD, MHS, and Keith F. Tomlin, BSPH

The welter of information and opinion that accompanies modern health care can be both confusing and, at times, dangerous. In this article we describe how a patient's experience with lung cancer was helped by use of a portable medical record called a personal health organizer (P.H.O.). The P.H.O. uses the format of a medical record so any health care provider can quickly become familiar with it, yet it is easy to use so that patients can also understand their own medical information.

Case Study

A 64-year-old businessman began using a personal health organizer approximately 6 months before being diagnosed with non-small cell carcinoma of the lung. We interviewed him about 6 months after the lung cancer diagnosis; the following excerpts were taken from that interview.

The cancer diagnosis. "Lung cancer is scary. The organizer made me less frightened. Knowing what was happening and understanding it was important. The organizer was a tremendous aid in my ordeal of the whole process.

"The organizer gives people a tool with which to approach the illness. People aren't so much scared of the cancer as they are of the unknown, the lack of control. For example, let's say you're hiding in a cave from a tiger. In order to make your escape, you're going to run for it in the daylight, not in the darkness—even though the tiger has a better chance of getting you during the day. You'd rather do it during the day because at least you can see it coming. If you are faced with death, you just don't want to feel like you've lost control."

Improved communication during therapy. "During my treatment I visited two internists, a thoracic surgeon, an oncologist, a radiation therapist, an orthopedist, an occupational therapist, and a dentist. Once, when I went to a doctor for treatment, I showed the P.H.O. to him and he was really interested. I don't suppose he routinely gets that much medical information about patients so quickly.

"I think the doctor was able to explain things better because, by having the organizer, he saw that I was interested in what he was saying.

"I guarantee that, without the P.H.O., I could not have gone through this process with such clarity of understanding. With the organizer, I could even tell my wife and family what the doctor said when they asked."

Time management. "I had 35 radiation treatments, and chemotherapy every Friday. Because I had all of the clinic phone numbers in the organizer, I would call ahead to see how the doctor's schedule was for that day. Once, I called the surgeon and he was in surgery, so I put it off until the next Thursday. The next Thursday they called me because he was in surgery again. On several occasions, I'd say the organizer saved me 3 or 4 hours of going over there and discovering that he was tied up in surgery. I'm still working, and I can't afford to wait for 2 or 3 hours in a doctor's office simply because he's unavailable in surgery.

"I think the organizer helped me know what the doctor thought I needed to know, so it saved time in the visit. I don't think it caused a problem with the doctors. They seemed happy to explain things to me because I took such an interest."

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Keeping track of the details. "What the doctor wrote in the organizer applied specifically to me: 'This is what can happen, and here's what might happen.' I also kept the detailed, side effect hand-outs and emergency instructions in the organizer—just in case. The oncologist told me what I needed to know in general, but with the organizer I knew that if I wanted to study the details, I could. And I did, many times.

"The organizer taught me how to obtain the hospital discharge summary and operative report. The operation cost $30,000—I think I have a right to a summary report of it."

Portable Medical Records: Previous Research

In a world where health care is becoming more and more complex, managing information related to health care gets more and more difficult. A simple strategy to help patients manage their health care is a portable medical record. Previous research has shown that patients and doctors find portable medical records to be very helpful (Table, below).[1-7] One study involved 47 older patients who used a bracelet and wallet card to improve the awareness of medical problems;[8] another looked at how a portable record helped coordinate the care of 41 homeless, mentally ill patients and disseminate information previously unavailable to all providers.[9]

To address the problem of continuity of preventive care, the Tennessee Department of Health and Environment developed a *Medical Passport* to record the preventive care delivered to children in the state.[10] After reviewing the literature, Dickey concluded that "A patient-held mini-record is an inexpensive, practical intervention that can help build patient involvement and improve the quality of preventive care for adults as well as children."[11]

One of the most important lessons learned from previous research is that patients are much more likely to use portable medical records if their health care provider is enthusiastic about them.[12] In one study, an enthusiastic provider was able to convince 77% of patients interviewed to use a portable record, but a provider who did not like such records was able to recruit only 13% of the patients he encountered. In other words, patients will maintain their records if their health care provider

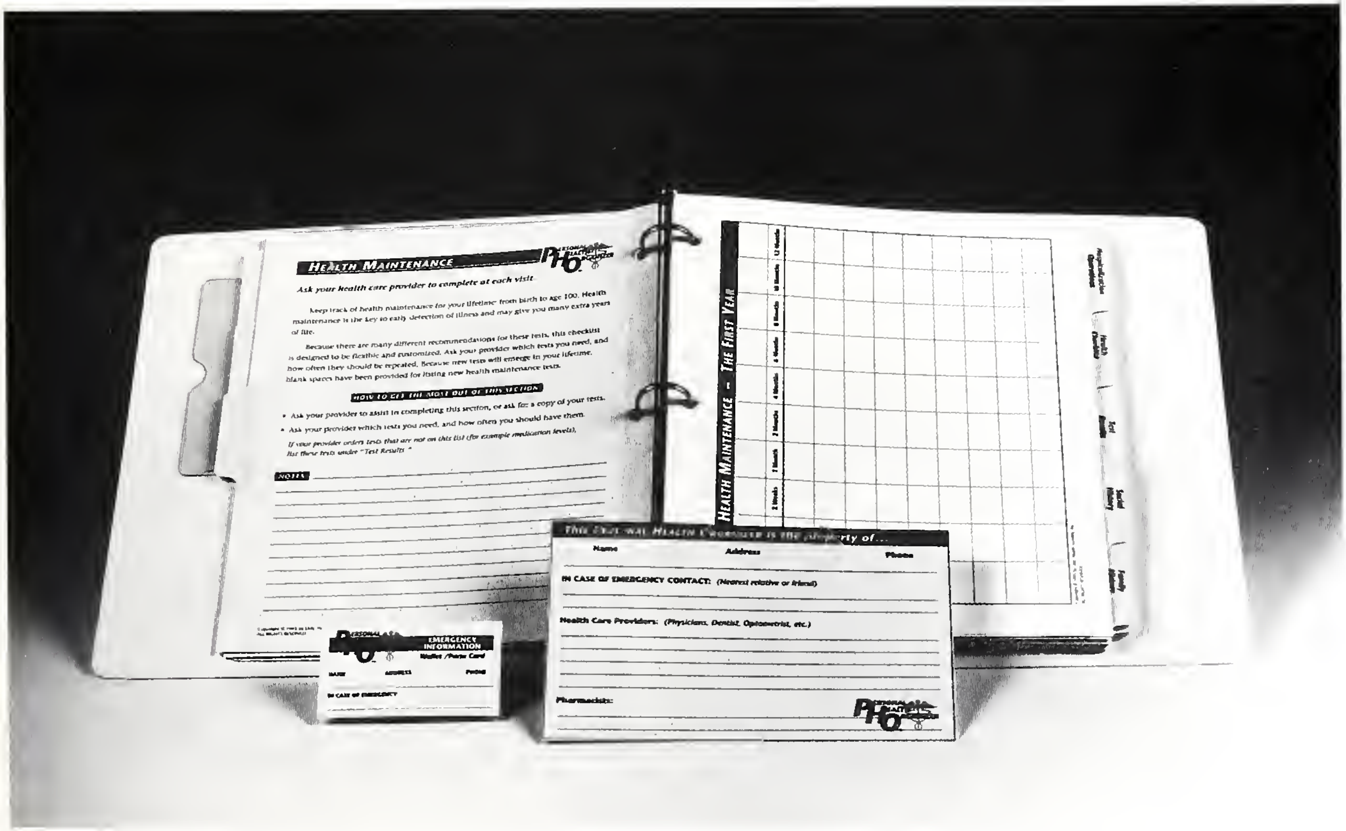
Table

Summary of Studies Using Various Types of Portable Medical Records

Study	Type(s) of record	Type(s) of care	Description of study and results
Giglio et al. 1978	Loose-leaf notebook	Most types of preventive care as well as acute care	70% would continue using on own. Enhanced compliance involvement in health care.
Giglio and Papazian 1986	1. Loose-leaf notebook 2. Wallet-sized card 3. Passport-sized booklet 4. Folder of photocopies of actual medical record	Dependent on type of record.	Patients liked wallet-sized best. Providers liked passport-sized best. More patient entries in larger records. Provider opinion was best predictor of patient usage. Most patients used after end of trial.
Dietrich and Duhamel 1989	Wallet-sized paper card	Immunization, screening	Randomized, controlled trial with geriatric patients. 44% retention after one year.
Belcher 1990	Wallet-sized paper card	Most types of preventive care	Randomized, controlled trial with VA hospital patients. Mailed records not related to improvements in care.
Turner et al. 1990	Passport-sized paper card	Mammography, stool occult blood, breast exam, Pap smear, influenza and pneumococcal immunization	Improvement in 4 of 6 preventive services relative to comparison patients who did not receive the card - Pap smear (30% vs. 20), breast exam (52% vs. 29%), influenza immunization (47% vs. 29%), stool occult blood (59% vs. 46%).
Dickey and Petitti 1992	Passport-sized paper card	Most types of preventive care	Significant improvement in overall compliance with recommended schedule of preventive services at 6 months (63% to 76%).
Schapira et al. 1992	Wallet-sized plastic card	Mammography	Randomized, controlled trial. Women who received the minirecord were more likely to return in 1 year for mammography (72%).
Tobacman, 1996	Check-book sized record	Preventive care Medical care	69% of patients maintained the record after 14 months.

Adapted from Dickey LL. Pat Educ Couns 1993;20:37-47.

PERSONAL HEALTH ORGANIZER
TM


HEALTH MAINTENANCE
Ask your health care provider to complete at each visit
HOW TO GET THE MOST OUT OF THIS SECTION
NOTES
HEALTH MAINTENANCE – THE FIRST YEAR
This Personal Health Organizer is the property of...
Name
Address
Phone
IN CASE OF EMERGENCY CONTACT: (Nearest relative or friend)
Health Care Providers: (Physicians, Dentist, Optometrist, etc.)
Pharmacists:
EMERGENCY INFORMATION
Wallet/Purse Card

believes it will be useful, just as diabetic patients will perform the awkward, time-consuming task of monitoring blood glucose if their health care provider recommends it.

The Personal Health Organizer

By applying time management principles to a portable medical record, we developed a personal health organizer to assist patients and health care providers in the management of medical problems. Our 3-ring binder system follows the general format of a hospital or clinic medical record. Through focus groups and field testing, we came to include 10 sections: medical problem list, allergies, medications, social history, family history, health instructions, hospital discharge summaries, test results, health maintenance flow sheet, health symptom checklist, and immunization flow sheet. Patients complete the patient portion of the organizer, take it to all health care encounters, and modify it to suit their own needs. To improve health care awareness, the organizer tabs are overprinted with important health care tips.

We have found that writing in the P.H.O. helps patients remember their health problems and their health instructions (Figure). In general, patients become better equipped to talk with their doctors about their problems because they become familiar with the often complicated medical terms. Patients also use the P.H.O. as a place to store important health information, including phone numbers, educational handouts, newspaper articles, appointment cards, calendar reminders, and health plan benefits. Because the P.H.O. uses a 3-ring binder, patients can customize the system to their own needs. For example, one patient created his own tab system to correspond to the different doctors and clinics he visited. This individual also maintained a flow sheet of laboratory tests; he detected a clinically significant laboratory abnormality (decreased hematocrit), and brought it to his doctor's attention.

Comments

Despite extensive research showing that portable medical records are helpful, they have not found widespread use. Our case study shows how the personal health organizer—based on time management principles—helped one patient gain control over his medical condition, and simultaneously ensures quick, reliable access to medical information for his many health care providers.

Some people hope that technology will solve the current crisis in medical information management. We do not think that complicated, "high-tech" solutions are needed. What we most need are simple, economical solutions especially targeted to older patients who are not familiar with computer technology (in 1995, less than 5% of people aged 65 or older used computers regularly[13]). Furthermore, computerized information storage systems like a "medical credit card" do not allow the patients to become involved in their own health care.[14]

We are presently conducting a pilot study to assess the effect of a personal health organizer on health care. This 6-month, prospective, observational study involves health care providers and outpatients from the Durham VA Medical Center. The patients will attend three focus groups over a 6-month period to discuss how to use the organizers. At each meeting, the patients will complete questionnaires designed to assess the usefulness of the organizers and to monitor whether the organizers affected their medical care.

Already, we have observed that the P.H.O. gives patients a feeling of control over their medical problems. It also improves the efficiency of health care provider-to-patient communication, provider-to-provider communication, and patient-to-family communication. Further formal research will show whether this effect is generalizable to other patients and clinical settings. ❑

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Carolina Physician's Bookshelf

The Tennis Partner *by Abraham Verghese, MD*

New York: Harper Collins, 347 pages, publication date: September 1998

Reviewed by William G. Porter, MD, Charlotte physician, and Journal Editorial Board member

Abraham Verghese is an infectious disease specialist who established his literary reputation with *My Own Country*, a memoir about his experiences during the early years of the AIDS epidemic in Johnson City, Tennessee. One of the themes of that book is the central place of ritual and repetition in the clinical method. Over and over again, like a penitent at his prayers, Verghese compulsively negotiates his encounters with patients. First a comprehensive history, then a detailed physical examination: inspection, percussion, palpation, auscultation. No shortcuts. No omissions. Never mind that, however complete the history and physical, most of his patients will soon be dead. The process itself—disciplined, unvarying—has for Verghese a value independent of its utility. Like Dr. Rieux in Camus's novel, *The Plague*, Verghese uses ritual and repetition to give meaning to his daily round.

Now a professor of medicine at the University of Texas-El Paso, Verghese revisits this theme in *The Tennis Partner*, a memoir of his friendship with David Smith, an Australian medical student and recovering cocaine addict who once played professional tennis. In what Verghese calls the "tennis ritual," he and Smith begin to play—no, that's not the right word—they begin to *perform* tennis with each other. Smith is a natural. His strokes are picture-perfect and seemingly effortless. Verghese, a good player, labors to improve his game. He keeps a notebook of tactical do's and don'ts. He repeats his mantra: "Bend your knees; watch the ball; hit through the ball; don't overhit," and remembers his childhood belief that "if you mastered the art of tennis, the art of hitting a ball that was never in one place, it brought about a parallel and salutary effect on the psyche."

Yet even when Verghese does everything "by the book" and hits a penetrating shot, Smith usually anticipates it and hits a winning return. Ritual and repetition by themselves are no more successful against a better player than they are against AIDS. But they *are* necessary strategies for success in medicine, and, Verghese intimates, in life. Natural gifts might be central to athletic success, but one needs self-discipline, ritual, and repetition to prevail against the demands and temptations that each day brings.

And it is here that Verghese and Smith differ. Both have troubled personal lives. Smith is struggling with addiction and with stormy romantic relationships. Desperately poor, he lives in a squalid rented room and has to borrow a tennis racquet from Verghese before they can play. Verghese has just completed a disorienting move to a new job in a strange culture, and is struggling with a painful separation from his wife and young children. For him, the tennis ritual, like the clinical routine, is a way of imposing order, of keeping the demons at bay: "Take the history; do the physical; bend the knees; watch the ball." Smith's off-court life has no such discipline. His athletic gifts do not help him negotiate the disorder and craving for cocaine that shadow him. On the wards and in the clinic, Verghese does his best to encourage Smith, and for a while he succeeds—he has the intelligence and skills medicine requires—but the demons never turn him loose. Today's abstinence and self-discipline are no guarantee against tomorrow's relapse, no substitute for the ecstatic momentary rush that only cocaine can provide.

Despite their differences, Verghese and Smith become trusting friends: "the role that we had both slipped into, that defined us, was that of friends, equals. His superiority on the tennis court or mine in the hospital were superfluous." It is this friendship—what it teaches pupil and master about each other and about themselves—that gives this memoir its poignance and power. For strong as their friendship is, it alone cannot immunize Smith against relapse. His illness is a dark chamber of his psyche that remains inaccessible even to those closest to him.

Physician-readers of this affecting story will no longer view professional impairment as a bland abstraction. David Smith is flesh and blood, and even at his sickest, human to the core. As is Verghese, whose narrative skills and powers of observation give this book an immediacy and authenticity that are sure to appeal to clinicians. It will appeal also to everyone who has known the intimacy and complexity of friendship, and all that is required to sustain it. ❑

A Dogma Upended From Down Under

Sister Elizabeth Kenny's Polio Treatment

Mark W. Swaim, MD, PhD

Editor's note: This essay was one of two honored with the Irwin A. Brody Award for essays on the history of medicine. The award was sponsored by the Brody Fund for the History of Neurosciences and the Medical History Society at Duke.

> Wonderful little, when all is said,
> Wonderful little our fathers knew,
> Half their remedies cured you dead—
> *Most of their teaching was quite untrue...*
> —Rudyard Kipling

In 1993, poliomyelitis broke out in Sudan; containment has been hampered by civil war. As with the polio epidemics that terrified Americans throughout the 1940s, 85% of those afflicted in the Sudan were less than 5 years old. These events seem distant to us; the threat of polio was eradicated from North America as of 1991. Today, the names Salk and Sabin are associated with polio because their vaccines eliminated it from the developed world. But a generation ago, the name for polio was Kenny.

On April 14, 1940, Elizabeth Kenny, a broad-shouldered Australian Army nurse in a wide-brimmed hat, disembarked from an ocean liner, and stepped onto a pier in Los Angeles.[1p203] Portmanteau in hand, she was alone in every sense. She was 59 years old, bitter and battle-fatigued, though not from combat. No cameras recorded her arrival, though within two years news photographers' flashbulbs would punctuate her every public move. She was adamant that the universal standard of care for polio-afflicted patients—rigid casting of diseased limbs—was wrong.

As a lieutenant, she had earned the deference given to a head nurse, and the marquee moniker that would soon stir up professional and populist circles: *Sister Kenny*. In British tradition, a head nurse is called by the honorific "Sister," but how Elizabeth Kenny came by this title is speculative. She lacked formal education, was not above obfuscation about her qualifications (in later years she lied about her background for *Who's Who in America*), and possibly opportunized wartime circumstances, so "Sister" may have been self-bestowed. Because of her authoritarian manner, colleagues would have been unlikely to question the designation, whether earned, conferred, or assumed.

She kept asking, plaintively, "Why condemn patients to life with splinted arms and hobbled legs when they can be rehabilitated by my method"? Two years earlier, in 1938, a ballyhooed position paper in the *Medical Journal of Australia*[2p187] had ridiculed Sister Kenny for asking that question. The paper was produced by a special Australian Royal Commission, appointed in 1935 at her demand, to study her controversial method. Limb splinting for polio was an article of faith among English-speaking medical communities, and Kenny's insistence that it be abandoned infuriated Australian physicians.[3] She was a provincial woman, a homemade nurse without solid professional credentials, practicing what doctors (nearly all men) saw as insubordination.

Though she relished her role as David to their Goliath, Kenny was sure that a balanced examination would reveal the superiority of her approach. She cooperated with the Commission's doctors in their appraisal of how polio victims fared when treated by her regimen of massage and "muscle reeducation." The Commission included Kenny's longtime friend, advocate and mentor, Dr. Aeneas McDonnell. She was confident that its findings would vindicate her.

Her hopes were dashed. The Commission's findings, kept secret until the report's release, condemned her:

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> "We are now in a position to sum up this discussion of the Kenny method of treatment of poliomyelitis.... The abandonment of immobilization is a *grievous error* and fraught with great danger, especially in very young children, who cannot cooperate in reeducation.... It would be particularly damaging to adopt the Kenny non-splinting method of treating early cases...."[2p203-4]

A critical reading of the report betrays serious flaws—rife preconceptions, and dismissal of her ideas because they flew in the face of conventional wisdom. Kenny was devastated even though the report contained a small-print appendix acknowledging a recent British study that described marked improvement in 370 patients treated with the Kenny method, and concluding, "No published results we know of can compare with those achieved in Australia [by the Kenny method]."[4] The Commission chafed in rebuttal: "To the anatomist and orthopedist, this statement is so ridiculous as to need no further comment."[2p222]

Sister Kenny knew that the medical establishment, at least in Australia, would not tolerate her. Her clinical allies rethought their allegiance to her. She would be unable to practice nursing effectively in Australia. She packed.

A Dreaded, Crippling Scourge

How did Sister Kenny care for patients with acute poliomyelitis? And why did the Kenny method, different from standard approaches, provoke the wrath of medical authorities?

In June 1911, Elizabeth Kenny was called to see a child, Amy McNeil, with acute infantile paralysis (poliomyelitis). Kenny, working alone in the desolate outback near Queensland, Australia, was an untrained, self-appointed nurse who roved on horseback among desert homesteaders. She was 31, and had never encountered polio before that summer outbreak. What she saw, first in this farm family's daughter, appalled her:

> "...It was the little girl [Amy], my special pet, who was ill. She lay upon a cot in the most alarming attitude. One knee was drawn up toward the face, and the foot was pointed downward. The little heel was twisted and turned outward, or abducted, as we say. One arm lay with a flexed elbow across the chest. Any attempt to straighten a member caused the child extreme pain. The little golden-haired girl...was indeed very sick, and with an ailment that was unknown to me....
>
> [Her] obvious agony called for immediate action.... The cruel shortening of the muscles affected, the wild fear expressed in the once laughing blue eyes, the tenseness and terror of contact even with the loving arms of the almost distracted mother, were sufficient to wring the heart of anyone who witnessed them."[1p22-3]

Even allowing for some license in this description (written with a biographer's help), the clinical acumen is apparent. She recognized muscles in tetanic spasm, not merely contracting unopposed by disease-stunned muscles opposite them.

She was baffled, scared, and miles from help. A scrappy bush nurse desperate for advice, she telegraphed Aeneas J. McDonnell, MB, BCh, a clinical mentor and family friend. McDonnell was a highly-regarded physician in nearby Toowoomba. His Morse-code reply came by wire hours later. It gave her little hope but, unwittingly, sage advice: "Infantile paralysis. No known treatment. Do the best you can with the symptoms presenting themselves."[1p22-3]

Virtuoso Ignorance

She did precisely as he suggested. Her crisis, as Confucius says in his *Analects*, was opportunity. "Fortunately," she writes, "I was completely ignorant of the orthodox theory of the disease."[1p22-23]

She poured steaming-hot water over strips of wool. Assisted by the child's parents, she applied these hot, wet compresses hour after hour to affected limbs. By her reckoning, the tense muscles needed relaxation, and moist heat seemed a good strategy. Gradually, the hot packs eased the agonizing, palpable muscle spasms of the acute myelitis. At the time, neither the term "spasm" nor the occurrence of tetanic contractions in affected muscles was accepted by clinicians treating polio. Sister Kenny would be told that the muscles she had seen only seemed to have increased tone. Things looked that way, standard teaching argued, because muscles on the limb's opposing side had been rendered flaccid by poliovirus.

Paracelsus said that *patients* should be the clinician's textbook, for "they will never mislead." As Kenny saw for herself at the bedside, muscles that were, at first, animated by spasticity soon became flaccid, leaving arms and legs useless. Depending on the spinal levels of anterior horn cells affected, various extensor and flexor muscles were left with more or less severe impairment of function. The distribution was commonly asymmetric.

To Sister Kenny, it seemed as though these slackened muscles had "forgotten" how to work, or the brain had forgotten how to control them. She reckoned that nerve damage had "alienated" them from the brain. The muscles, denervated by poliovirus-induced damage in the spinal cord, needed "reeducation," she said. But how could one work a muscle that was not downloading commands from the brain? She knew that striking muscle tendons provokes a reflex muscle contraction. This was a way to make muscles work without the brain's intervention. Methodically, diligently, shaman-like, she spent long sessions at patients' bedsides, striking the patellar, biceps, and other tendons. She guessed that this would maintain muscle strength until brain and muscle could become reacquainted.[5]

Meanwhile, worried that unused joints would stiffen, she began flexing them passively through their ranges of motion. Diseased limbs needed increased blood flow, she decided, so she massaged them. She flexed and extended muscle groups, stimulating proprioceptive sensations. Throughout, she helped the afflicted children devise mental images of how their brains could command their "alienated" muscles to work again.

Kenny was too unsophisticated clinically for a pattern-recognition approach to polio. She had neither seen, studied, nor been taught about the disease. In blunter terms, she was too unschooled to begin automatically the standard treatment of polio—fixed immobilization of affected limbs. If her formulation of the problem was homespun, it was leavened by hope and enthusiasm. A redeeming positivism ran throughout the Kenny method. She energetically set upon the affected arms and legs of her patients. Her task was to enliven the children, encourage them, and reanimate their limbs to recovery by hands-on persistence. She cheered when they showed improvement.

In the beginning, the rudimentary Kenny method was extemporaneous: Kenny's wits collaborating with nature to help Amy McNeil, and other children stricken in the Australian outbreak of 1911, to walk again. Word spread in the outback. Her ignorant improvisation worked so well that when doctors saw the results—ambulatory children, often none the worse for their brush with crippling illness—they scoffed.[1p29-32] A mistake had obviously been made. The unschooled Kenny must have misinterpreted what she had seen. If these children had truly come down with polio, she was told, they would be crippled.

Like her medical and orthopedic contemporaries, Kenny recognized that the polio symptom complex, untreated, left deformed, functionless limbs, twisted spines, and contracted muscles. Affected muscles might be overcome by stronger muscles on the opposite side. Dangerous torque and shear forces would be exerted on joints and on the vertebrae. The disease made limbs crooked, and the task of doctors was to force those limbs, and keep them, straight. Here Kenny broke rank with conventional wisdom.

Orthopedic Orthodoxy

The "orthodox theory" of polio, summarized in 1941 in the *Journal of the American Medical Association*,[6] was, ironically, published just five months before *JAMA* endorsed the Kenny method. Dr. C. E. Irwin, a noted clinician at the Warm Springs Foundation (Georgia) polio treatment center (famed for a presidential patient, see below) wrote:

> "The first and most important indication, is absolute and complete rest and no exercise. Exercise is contraindicated as much in these cases as in cases of acute myocarditis or overfeeding a patient with intestinal ulcerations following typhoid.... Complete rest is the basic principle of treatment which I wish to emphasize.... In addition to recumbence and non-weight bearing, adequate rest is best provided by plaster casts.... Casts are comparatively inexpensive and are more positive.... The patient is more comfortable.... My purpose is to emphasize the importance of complete rest...."[7]

Dr. Irwin's paper articulates flatly the pre-Kenny standard of polio care. Its innuendo, however, provokes hopelessness and stigmatization. To contract polio was to face life with crutches and garish orthopedic devices or, possibly, confined to bed. Irwin calls casts "more positive" than splints, but that he resorts to such a description underscores the dreadful negativity of the treatment advocated by experts. In 1962, this orthopedic approach was condemned as "the abuse of rest."[8]

When Sister Kenny came in 1940, America was the right place at the right time for someone offering hope to polio victims. After a serious polio epidemic in 1916, the United States had experienced relatively few cases, but polio outbreaks were on the rise again. In public view, future-President Franklin D. Roosevelt was stricken in 1921. Outbreaks, real, rumored, or feared, were the stuff of newspaper headlines. Families cancelled spring and summer vacations, as these seasons were riskiest for outbreaks. People avoided public places and shunned persons rumored to have polio. Polio, or the fear of it, was a scourge threatening the social fabric of this country.[9]

Kenny's first months in America were spent much as she had lately lived in Australia, roving in search of acceptance, touting her polio ideas. She arranged introductions to prominent surgeons at tertiary-care medical centers. Yet garnering attention for her concepts without calling attention to herself proved nearly impossible. She was a woman—an uneducated spinster with quaint hats, a brusque manner and a peculiar accent—asking powerful white-coated men in a male establishment to rethink their most entrenched assumptions about polio. Listening to Sister Kenny required a suspension of disbelief.

Two men who listened and got it right were Dr. Wallace Cole, chief of orthopedic surgery at the University of Minnesota Medical School (Minneapolis), and Dr. Miland Knapp, a young surgeon who chaired the school's department of physical therapy. Sister Kenny had come to Minneapolis after failing to win converts on either coast.[3]

Sister Kenny's claims, based on scattered newspaper reports of her visits, began to attract a populist following. To many, Kenny was a charismatic underdog whose rejection by doctors suggested that she had a disarmingly powerful message. She offered hope where doctors offered only crutches, braces, and guarded prognoses. Whether she was right or wrong, at least one well-placed person, Basil O'Connor, recognized that her popular admiration could be a motherlode of political equity. O'Connor was the shrewd amanuensis and law partner of President Franklin D. Roosevelt. O'Connor was an astute businessman, his nose for trends and opportunities ever in the wind. He was the driving force behind the National Foundation for Infantile Paralysis (founded by FDR in 1938 and the White House's favorite charity, it was christened "March of Dimes" by entertainer Eddie Cantor). If the Foundation cautiously supported Kenny, donations and presidential approval might soar in tandem.

With financial backing from the National Foundation for Infantile Paralysis, Drs. Cole and Knapp enrolled 50 patients with early poliomyelitis in a clinical trial in Minneapolis. Their study, begun in June 1941, would treat patients by the Kenny method, either with the supervision of Sister Kenny or with assistants trained by her.[3]

An unsigned editorial in *JAMA* on December 6, 1941, begins the concession to Sister Kenny:

> "At one time it was believed that in early cases of poliomyelitis, complete immobilization should be done as far as the affected muscles were concerned. Several years ago, Sister Kenny in Australia recommended that early movement should be allowed and that affected muscles should be accorded the benefit of massage and passive movement instead of immobilization...." [Motor units] become atrophic under conditions of immobilization, since muscle fibers are dependent on their local reflexes (e.g., stretch reflexes) and immobilization arrests the flow of these proprioceptive impulses as effectively as it abolishes the flow of lymph. Massage and freedom of movement, therefore, are clearly indicated...."[10]

On December 20, 1941, another *JAMA* editorial cited a meeting of the National Foundation for Infantile Paralysis:

> "It is the opinion of this Committee on Research for the Prevention and Treatment of After-Effects of the National Foundation for Infantile Paralysis, after a study of the report of the workers at the University of Minnesota, that during the early stages of infantile paralysis the length of time during which pain, tenderness, and spasm are present is greatly reduced and contractures caused by muscle shortening during this period are prevented by the Kenny method."[18]

The editorial applauds the "revolutionary...abandonment of early rigid splinting and the adoption of continuous and meticulous hydrotherapy and physical therapy to maintain the function of muscles which still have nerve supply at highest possible point, at the same time producing increased comfort for the patient."[11] Dr. Cole and Dr. Morris Fishbein, *JAMA* editor-in-chief, broadcast a national radio address endorsing the Kenny method as the new standard of care that should replace existing approaches polio.[2]

Sister Kenny became and remained a celebrity ever pressed for autographs, her face instantly recognized, her photograph displayed like an icon in many American homes. In 1943, and for nine years thereafter, she ranked behind only Eleanor Roosevelt as the most-admired woman in America. She received honorary doctorates from the University of Rochester, Rutgers, and New York University. She returned to her outback home a hero, and died near Queensland, Australia, in 1952.

Truth and Consequences

In *Aesopus Emendatus*, Ambrose Bierce writes of a woman named Truth: "I live in the desert in order to be near my worshippers when they are driven from among their fellows. They all come, sooner or later."

Kenny's victory was a Pyrrhic one: a revised treatment for a disease in its twilight, promulgated by a woman in her twilight. The cost to Kenny was high: professional ostracism from her homeland, three decades of rejection and, arguably, personal happiness. For us now, two aspects of her story are salient. To paraphrase Santayana, history repeats itself because no one is listening. These two aspects of the Kenny saga are likely to be experienced by others who challenge conventional wisdom.

First, Kenny's method emerged from an improbable source of discovery. Despite her lack of formal education (maybe even *because* of it) Sister Kenny perceived a deeper truth about the clinical manifestations of acute polio. For many, education is synonymous with training, prescribing what must be learned and should be believed. This can preempt open-mindedness. Barry Marshall, the Australian physician who found that *Helicobacter pylori* causes most upper gastrointestinal ulcers, says he was able to do his work because he wasn't adequately schooled in the conventional belief that acid caused all ulcers.[12] Kenny's story is emblematic of the process of seeing —"*seeing*," as Charcot said to the medical students[13]—things afresh, being helped but not misled by learning. Sister Kenny wrote of a physician who said he wanted to learn about her method and professed an open mind: "I have encountered many 'open minds' in the medical profession in many parts of the world, and I have learned to proceed with caution when I come upon one now. Some minds remain open long enough for the truth not only to enter but to pass on through by way of a ready exit without pausing anywhere along the route."[1p29-32]

In his *Choruses from 'The Rock*,' T. S. Eliot asks, "Where is the wisdom we have lost in knowledge?" Sister Kenny showed that rehabilitation of the polio-afflicted was simple and reasonable. It makes one wonder whether decades of entrenched clinical dogma about polio was sensibly formulated. Carrying Eliot's sentiment further, is wisdom undermined by learning? Sister Kenny's work was predicated on a primal reverence for nature beheld firsthand and undiffracted by learning. Kenny's initial encounter with polio evokes the "understanding through empathy" memorably described by British education professor Peter Kelly as he watched 7-year-old children go about observing plants and animals. He contrasts their behavior with that of a group of 14-year-olds:

> "The seven-year-olds looked at, smelled, handled, listened to, and even tasted the elements of their environment. They immersed themselves in their individual tasks and came out of their endeavors only occasionally, to inform and sometimes to show off their discoveries to their fellows....
>
> The older children approached their work differently. They used their eyes, but rarely their other senses. They were very concerned with social approval. Were they doing what their fellows were doing? Would they make fools of themselves? When asked questions about their work, they called on the authenticity of the books they had read, television programs they had seen, or what they had been told by their teachers. They remained at a distance from the reality they were studying. The 7-year-olds tended to work themselves right into the reality.

> This experience demonstrates what I believe to be a truth: that through the processes of formal education and social development, a young person is drawn away from the realities of his or her environment, away from other living things...."[14]

Second, Kenny's saga is a cautionary parable about how often fresh insights are laughed at, and how clinical breakthroughs gain acceptance only after first being called heretical. Prior to Kenny, doctors mistakenly equated one manifestation of polio—muscle denervation and weakness—with the totality of the illness. Kenny was told sternly that muscle spasms did not exist, and that what she had observed were diseased, weakened muscles simply overcome by opposing muscles. Kenny saw this as flawed reasoning and reckoned that the problem in polio was acute spasm, not flaccidity. This was an essence that doctors had missed.

Though the notions of muscle rehabilitation and passive joint motion were accepted tenets of polio care before Kenny, rehabilitation was rarely, if ever, attempted. Polio was a grim fate because it commonly meant life constrained by orthopedic braces. Limb rest often led to more limb rest because disuse atrophy and flexion contracture put the diseased limb at risk of injury by well-meaning attempts to work it. Bracing limbs prevented deformity, but the limbs became useless for anything other than being braced. Sister Kenny was fond of pointing out how *stiff* the braced limbs of patients became: "The reply invariably was, 'That is of little consequence. See how straight [they are].'"[1p29-32]

Much of medicine is comprised of efforts to oppose and neutralize *symptoms* as if they are disease itself. Thus crooked limbs in polio were forced straight, as though superficial aesthetic rectitude meant better health. Even in our time, doctors generally advise antipyretics for patients with fevers. Much evidence, however, suggests that the febrile response is strongly associated, at least when infection is present, with both shorter duration of illness and greater likelihood of survival. Prior to the recognition of *Helicobacter pylori* as a cause of peptic ulcer, ulcer therapy was aimed at decreasing acid production. Excessive acid generation, however, is a secondary manifestation of *H. pylori* infection, and inhibition of acid secretion may promote proliferation of an antibiotic-resistant form *H. pylori*.

Much of medicine's history, as with Sister Kenny, documents the tormenting of those who challenge orthodoxy. On March 20, 1849, Ignaz Philipp Semmelweis was fired from his job as assistant physician in the First Obstetric Clinic of the Allgemeines Krankenhaus in Vienna.[15] He had discovered a clear link between puerperal fever and failure of clinicians to wash their hands between examinations or after performing autopsies (deaths were frequent in the clinic). His insistence on handwashing earned him the scorn of Viennese physicians. He fled Vienna and a promising career in medicine there, and returned to Budapest, his home. Semmelweis died four years later, at age 47, in a mental institution because of psychotic depression. The efforts of peers to ruin him had been successful.

As Canadian physician Earle Scarlett notes, the "human tendency to follow tradition and to blindly refuse to correct error is neatly contained in an old word that we would do well to resurrect and use more commonly. The word is a curious one and bears a strange look to modern eyes—*mumpsimus*. But it is a respectable word and has a most interesting history. It may be defined as 'a traditional custom obstinately adhered to however unreasonable it may be.'"[16]

A Cautionary Story

Nearly 60 years have passed since Elizabeth Kenny came to America. History has not been generous to her. What remains of her legacy is found in Bettmann Archive photographs of Kenny with the children she helped, in out-of-print books, rare newspaper clippings, and Movietone newsreels. Platitudes about her life's work are easily wrought, and her personality had a cantankerous, self-destructive, untrusting element that precluded long-term collegiality, but her story reminds us how breakthroughs come from unlikely sources, and how they are often recognized as breakthroughs only after first being called heresies. This, too, is the history of medicine. ❑

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American Indian Dreams

Our Complements

John Henry McWhorter, MD, MPH, and Stephen D. Ward, MD

From before the time of Genesis' Joseph up to Freud and after, the search for the meaning of dreams has been the province of the wise. It was no different with American Indian dreams; medicine men sought to divine the wishes (and enlist the favor) of the supernatural through the interpretation of dreams and omens.[1]

In particular, according to the writings of Jesuit missionaries to the Eastern woodlands of North America, the Iroquois natives held that disease was caused by unfulfilled dreams or desires.[2] Iroquoian groups, in elaborating this view, emphasized the concept of *Ondinnonk*—a secret desire of the soul manifested by a dream. In this they antedated Freud's ideas about wish-fulfillment in dreams and modern psychosomatic theories. Furthermore, they distinguished between conscious and unconscious aspects of the mind by recognizing manifest and latent dream contents. They used a verbal technique akin to free association in groups to reveal dreams' hidden meanings.[3]

> "The Belt and Swimmer manuscripts, collected in NC...grasped the idea of symptom formation and gave instruction about dream interpretation for initiates."

In comparison, the Cherokee (a people of Iroquoian linguistic lineage) used written formulas for the management of dreams. The Belt and Swimmer manuscripts, collected in North Carolina around the turn of the century, document what can only be called an extensive medico-psychiatric formulary. They grasped the idea of symptom formation and gave clear instruction about dream interpretation for initiates. Dreams had a prophetic nature, which gave significant weight in managing their fateful content. For example, if someone dreamed of snakebite, the dreamer was treated as if for an actual bite. Other dreams required ritual cleansing, and plants might be used to induce vomiting to prevent recurrence. Smoke from a fire of green cedar was used to counteract dreams ascribed to malevolent ghosts because it was believed that ghosts could not tolerate the smell.[4]

The precautionary treatment of dreams might be followed by ritual taboos of such things as hot food or salt. One Eastern Cherokee related that a piece of cedar wood placed under a pillow could allay dreams. Sometimes dreamers were instructed to ingest specific plants and then drink water at a designated source, after which the good vomiting that ensued would cleanse them.[5,6]

Our review of these medico-psychiatric practices of American Indians leads us to conclude that, to avert the prophetic consequences of an odius dream, an Iroquois might look for a hidden wish within the dream (and try to deal with it), whereas a Cherokee might seek purification through bodily catharsis. Contemporary psychotherapy often appears to operate in similar ways. These American Indian practices are both historically interesting and complement present day medical beliefs. ❑

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Striving for Excellence

A Neglected Challenge to Young Physicians

Dan G. Blazer, MD, PhD

"I will lead my life and practice my art in uprightness and honor."[1] — *Hippocratic Oath*

The above excerpt from the Hippocratic Oath may appear irrelevant to physicians who practice medicine during the latter 20th century. We don't use words like "upright" and "honor" in relation to medical practice any more. Yet, in my opinion, Hippocrates's challenge—to strive for excellence in practice through self improvement—is the most relevant and most neglected challenge facing young physicians today.

Two reasons why the challenge has been neglected are because: 1) The plea appears moralistic (especially when excellence is equated with how one leads her or his life as well as performs her or his work). Uprightness seems out of context in the scientific, depersonalized atmosphere of modern medical practice. 2) The language of excellence in quality has been used far less in recent years to describe goals for individual physicians and far more often to describe the goals of health care organizations (for example, "an excellent health care plan" or "an excellent medical research institute"). At a time when the individual still reigns supreme (the Army lures recruits by asking them to "Be all that you can be"), doctors find themselves viewed as just interchangeable parts in the system.

These days, when physicians consider excellence they are less likely to be motivated from within to practice better medicine than they are to be confronted with external monitors who encourage improvement as a management strategy. For example, computer technology has reduced the likelihood of prescribing errors by applying surveillance algorithms to screen the list of medications taken by a patient for drug incompatibilities or dosage errors.

Continuous Quality Improvement (CQI) is one such management strategy. The idea behind CQI is that health professionals need incentives, tools, support systems, and a "management philosophy" to improve patient care.[2] Clinicians are encouraged to believe that quality derives from group processes, and that multidisciplinary teamwork can identify problems and suggest and implement strategies to solve those problems. Without doubt, CQI *is* an important and effective strategy for improving the delivery of medical care. But CQI, and all aspects of quality and excellence in medicine, ultimately depends on the individual most responsible for quality in the delivery of health care—the physician.

Hippocratic physicians knew that responsibility for excellence rested with individuals. A physician who made a mistake might create problems for the entire system (including patients), but each physician had to learn from his or her own mistakes to be able to overcome even the most difficult problems. The Greeks viewed physicians metaphorically, as pilots of sailing vessels: "[M]any physicians seem to me to be in the same plight as bad pilots, who, if they commit mistakes while conducting the ship in a calm, do not expose themselves, but when a storm and violent hurricane overtake them, they then, from their ignorance of mistakes, are discovered to be what they are, by all men, namely, in losing their ship."[3]

As we move to a less individualistic health care delivery system, we are in danger of not identifying the physicians who make blunders as we did in the past. Of course, some physician behaviors will be monitored quantitatively (such as mortality rate after coronary bypass surgery), but this is only one determinant of competency in practice (and has nothing to do with compassion). Gross measures fail to accurately account, in many instances, for the severity of cases treated.

Even more worrisome, critical qualitative behaviors are in special danger of being overlooked. Consider that in a busy ambulatory care practice, the essential skill of listening to patients may be slighted, and the number of patients seen during an afternoon be substituted as the measure of quality. Less time with patients means less time devoted to listening. If we are truly to implement CQI, young physicians must take on the responsibility for excellence in practice—the responsibility,

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for example, to listen to patients. They cannot depend on health care systems to determine whether they practice well or not.

Three ways in which young physicians can strive individually toward excellence throughout their careers are:

1. Question your practice. After four years of medical school, you have acquired an incredibly large vocabulary and many key concepts. Nevertheless, you have just arrived at the threshold of your most intense learning experience: residency and fellowship training. Now you will "learn by doing" and gradually gain a sense of competence in your chosen field. After residency and fellowship training, you will begin to establish your practice or begin academic careers in earnest, pass final board exams, acquire true identity as a physician. One indication that you have finally "graduated" from training, that you have become a real doctor, is that you will be convinced that you "deserve what you are paid." After years of training and accumulating debt, you will have earned the right to this feeling.

Unfortunately, once you begin to think of yourself as a real doctor, stagnation can set in. As medical students and house staff you will have been bombarded with new facts, revolutionary ideas, and unique experiences. Once you enter practice, the new will not seem so new. Most so-called "revolutionary discoveries" will pass into obscurity almost as quickly as they appear. Your practice will not vary much from day to day, week to week, even year to year. Evaluating and treating patients will become second nature. You will not feel guilty if you do not read every issue of the *New England Journal of Medicine*, much less reflect on each article. How can this potential stagnation be averted? The antidote is learning to question one's practice. When I trained in psychiatry, psychoanalytic psychotherapy was in vogue. I have been a psychotherapist since then. Nevertheless, I always question the value psychotherapy for each person I treat. The question is not "Does psychotherapy work?", but, "What is it that I do—and my patient does—that will make a difference?" That is another way of saying "Is psychotherapy of any value for this patient?" Such questioning forms a type of "CQI " that I have incorporated into my own practice.

2. Get experience. As a medical student, I attached myself to a well-known cardiologist, because he was "Harvard-trained." I thought that if I stayed around him enough, I would learn something about hearts (I also thought that being Harvard-trained was the royal road to medical knowledge). He actually taught me little about hearts, either through discussion or through osmosis. Instead, he encouraged me to go "listen to some hearts." So I walked the wards listening to hearts. When I completed my rounds he would ask me, "What did you hear?" Despite my response, more often than not he would tell me, "Go back and listen again." Gradually I learned to distinguish types of murmurs and to become adept at making subtle distinctions between hearts sounds (at least for a medical student). Whatever competency I gained, I got by listening to as many hearts as I could, not by "being around" the Harvard-trained doctor. At the end of medical school this doctor told me that he spent many hours in training walking the wards, "listening to hearts." He became an excellent cardiologist not by being "trained at Harvard," but by listening to hearts.

To ensure excellence, you must be experienced. The necessity of experience is self-evident in surgery (you cannot maintain competency unless you continue to operate), but it is equally true in all other fields of medicine. Talking to patients, listening to them, examining them, reviewing x-rays, putting the data together to make a diagnosis—and doing it time and again—is the heart of continuous quality improvement.

3. Become a reflective practitioner. Donald Schön suggests in his book, *The Reflective Practitioner*, that the best professionals know much more than they can put into words, that they do not rely on formulas or algorithms but on an "improvisation" that derives from their practice. Schön calls this "reflection-in-action."[4] His principle pertains to the practice of medicine, although often at a subconscious level. The practice of medicine is sort of like riding a bicycle. At the outset, the student must think consciously about every move made and every step taken. After a while, however, interviewing a patient, examining a patient, reviewing lab data become routine.

It is always important to question what we do, but good practitioners cannot ask deep questions amid a cardiac arrest or complicated surgical procedure. Instead, they must simultaneously employ creative and unique ways to solve problems in their busy practices. They must question, but it is not enough just to question. They must make constant adjustments during even the most routine activities. A baseball player tries to be "un-conscious" as he swings at the ball a split second after its release from the pitcher's hand. Reflection and correction are constant accompaniments of the excellent batter. So, too, for doctors. The key is not to be "formula driven," but to be willing to reflect and adjust constantly. This means that excellent medical practice will always be an art of reflective adjustment along a well-worn path.

Quality begins and ends with the doctor. Quality may be informed externally but it is driven internally. There is no other way. If the practitioner of medicine "in uprightness and honor" is to be an excellent doctor, he or she must accept responsibility for continuous individual quality improvement. Questioning, gathering experiences, and practicing reflectively are a few ways to improve our practice throughout our careers. ❑

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CME Calendar

July 17-19
Heart Failure Management
Place: Ritz Carlton, Amelia Island, FL
Credit: 13 hours Category 1, AMA
Fee: physicians: $295, other health care professionals: $165, trainees: $105
Info: sponsored by Div. of Cardiology, and Schools of Nursing and Pharmacy, UNC School of Medicine, 919/962-2118, fax: 919/962-1664, *e-mail:* jane_radford@med.unc.edu

July 31-August 3
Duke University Technical Writers' Workshop
Place: Trinity Conference Center, Salter Path next to Emerald Isle
Fee: $595 single, $495 double (includes meals); $400 commuter (meals, no lodging)
Info: focus is on writing excellence across technical disciplines, including medicine; for brochure, call 919/684-6259

August 2-7
Ultrapath IX: Society for Ultrastructural Pathology
Place: Grove Park Inn Resort, Asheville
Credit: 28.5 hours Category 1, AMA
Fee: $495
Info: John Shelburne, MD, Box 3712, DUMC, Durham 27710, 919/286-6925, *e-mail:* shelburne.john@forum.va.gov, *Internet:* http://sup.ultrakohl.com/ultrapat.htm

August 3-7
27th Emery Miller Medical Symposium
Place: Myrtle Beach, SC
Credit: 20 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

August 7-9
The Older Patient: A Multispecialty Update
Place: Chateau on the Lake, Branson, MO
Credit: 12 hours Category 1, AMA
Fee: SMA member phys.: $395, joining member phys.: $495, nonmember phys.: $595, nonphys./resident: $295
Info: sponsored by the Southern Medical Association; contact SMA, P.O. Box 190088, Birmingham, AL 35219-0088, 800/423-4992, 205/945-1840, fax: 205/945-8885

August 25-28
Creative Writing Workshop for Health Professionals
Place: Trinity Center, Bogue Banks, NC
Fee: $695 single, $595 double (includes meals); $450 commuter (meals, no lodging)
Info: Co-sponsored by *North Carolina Medical Journal*; for brochure, call 919/684-6259

September 18-19
Geriatrics Symposium
Place: Winston-Salem
Credit: 9 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

September 25-27
Comprehensive Gynecology:
Clinical Update for Practicing Physicians
Place: Crowne Plaza Manhattan, New York, NY
Credit: 13.5 Category 1, AMA
Fee: $495 ($575 after July 17)
Info: Center for Bio-Medical Comm., Inc., 201/385-8080 ext. 26, *e-mail:* jrosenberg@cbcbiomed.com

October 2
Rheumatology Update for the Primary Care Physician
Place: Winston-Salem
Credit: 6 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

October 2-4
5th Annual Joint Meeting: NC and SC Chapters, American College of Cardiology
Place: Westin Hotel, Hilton Head, SC
Info: NC ACC, 4101 Lake Boone Trail, Suite 201, Raleigh 27607, 919/787-4916, *e-mail:* MADilday@compuserve.com

October 8-11
Coastal Medical Retreat and 15th Aesculapian Sports Classic
Place: Kingston Plantation, North Myrtle Beach, SC
Info: Beth Mixon, Coastal Area Health Education Center, 910/343-0161, ext. 312, or Bonnie Brown, New Hanover-Pender County Medical Society, 910/790-5800

October 9-11
"When Bad Things Happen to Good Doctors":
How to Survive in a Hostile Environment
Without Selling Out Your Ethics or Patients
Place: Crabtree Valley Marriott, Raleigh
Info: Assn. of American Physicians and Surgeons, 800/635-1196

October 14-18
Infectious Disease Board Review
Place: Ritz-Carlton Tysons Corner, McLean, VA
Credit: 41 hours Category 1, AMA
Fee: physicians: $845, physicians-in-training: $645 ($895, $695 after July 24)
Info: Center for Bio-Medical Comm., Inc., 201/385-8080 ext. 26, *e-mail:* cmeinfo@cbcbiomed.com

October 16-17
5th Fall Symposium on Atherosclerosis
Place: Blowing Rock
Credit: 6 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

October 25-28
Advances in Physiology and Pharmacology
Place: White Sulphur Springs, WV
Credit: 17 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

October 28-31
American Medical Writers Assn. Annual Conference: Biomedical Communication in a Changing World
Place: Vancouver, British Columbia
Info: AMWA, 9650 Rockville Pike, Bethesda, MD 20814, 301/493-0003, fax: 301/493-6384, *e-mail:* amwa@amwa.org, *Internet:* http://www.amwa.org

October 30-November 1
19th Mountain Medical Meeting
Place: Asheville
Credit: 12 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

November 4-6
13th Physician's Office Laboratory Symposium
Place: Charlotte Hilton
Credit: 22 hours, laboratory director certification for physicians
Fee: physicians: $495, nonphysicians: $545
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

November 12-15
NCMS Annual Meeting
Place: Sheraton Imperial Hotel, RTP
Info: Contact Dana Hammermeister, NCMS, 800/722-1350 or 919/833-3836, fax: 919/833-2023
e-mail: dhammermeister@ncmedsoc.org
Internet: http://www.ncmedsoc.org

November 14-15
25th Alexander Spock Symposium: Practical Management of Common Problems in Ambulatory Pediatric Patients
Place: Searle Center, Duke University Medical Center, Durham
Fee: physicians: $150 both days (or $100 for Saturday, $50 for Sunday); allied health professionals: $90 (free for physicians or allied health professionals in training)
Info: Joseph Marc Majure, MD, Assistant Professor of Pediatrics, Course Director, Box 2994 DUMC, Durham 27710, 919/684-2289, fax: 919/684-2292

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Aphorisms of the Month

Daniel Sexton, MD, Section Editor

"Assorted Quips & Barbs"

Scratching is bad; because it begins with pleasure and ends with pain. —*Anonymous*

He who scratches a scar is wounded twice.
—*Russian proverb*

Tis better than riches
To scratch when it itches. —*Anonymous*

The only cure for seasickness is to sit on the shady side of an old brick church in the country.
—*English sailor's proverb*

It is better that a fever succeed to a convulsion, than a convulsion to a fever. —*Hippocrates*

Sickness is better than sadness. —*Anonymous*

Sickness comes on horseback and departs on foot.
—*Dutch proverb*

When sleep puts an end to delirium, it is a good symptom. —*Hippocrates*

A cigarette is the perfect type of a perfect pleasure. It is exquisite, and leaves one unsatisfied. What more can one want?
—*Oscar Wilde (Picture of Dorian Gray)*

Trichinosis: The pig's reply to proponents of porcophagy.
—*Ambrose Bierce (The Devil's Dictionary)*

Persons living very entirely on vegetables are seldom of a plump and succulent habit. —*William Cullen*

The present letter is a very long one, simply because I had no leisure to make it short.
—*Blaise Pascal (Provincial Letters 1660)*

Section editor is Dr. Dan Sexton, Box 3605, DUMC, Durham, NC 27710. e-mail: sexto002@mc.duke.edu

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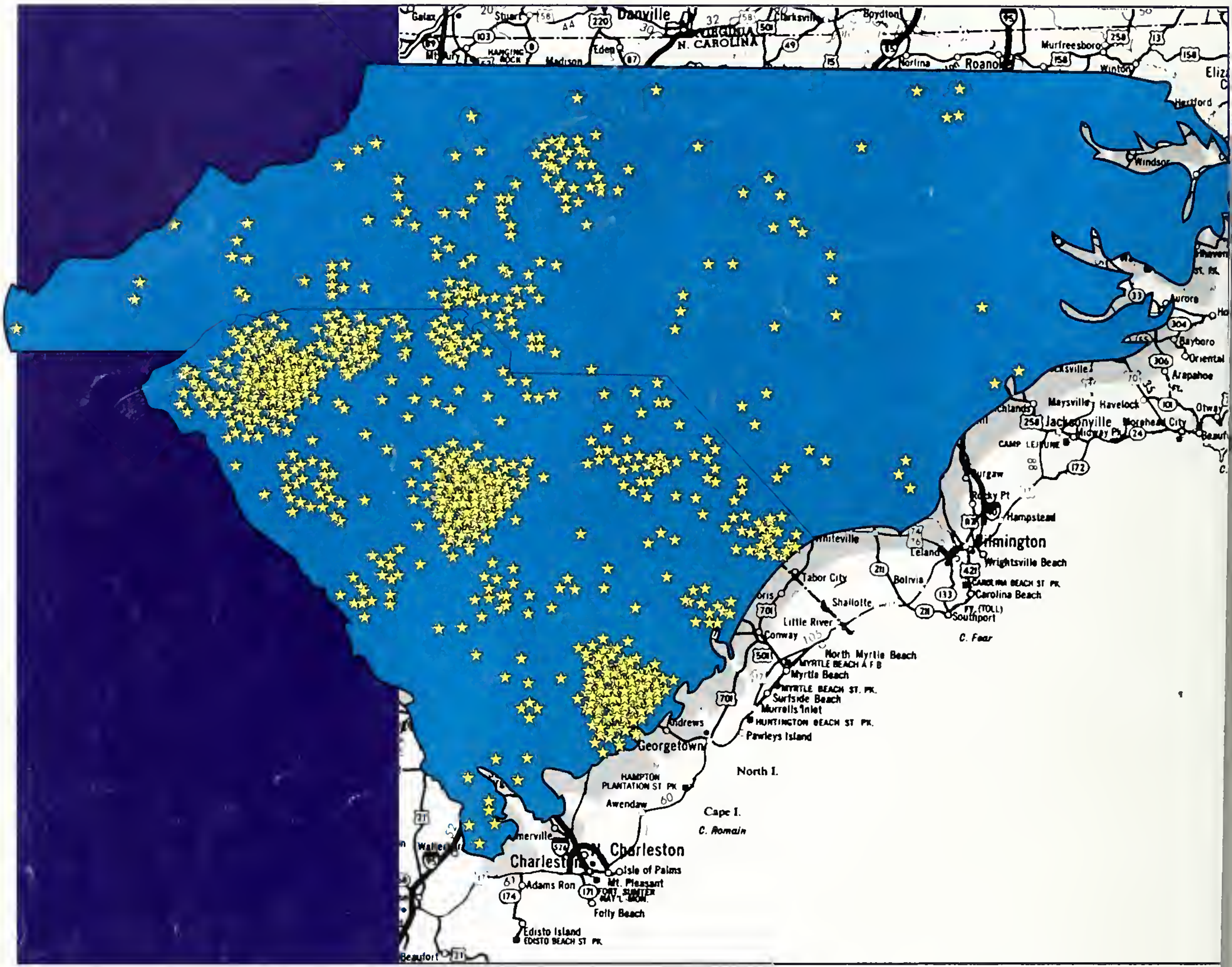

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North Carolina Medical Journal

For Doctors and Their Patients

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For Doctors and their Patients

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North Carolina Medical Journal

FOR DOCTORS AND THEIR PATIENTS

September/October 1998, Volume 59, Number 5

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Instructions for Authors

The *North Carolina Medical Journal* is a medium for communication with and by members of the medical community of this state. The *Journal* publishes six times a year: in January, March, May, July, September, and November.

The *Journal* will consider for publication articles relating to and illuminating medical science, practice, and history; editorials and opinion pieces; letters; personal accounts; poetry and whimsical musings; and photographs and drawings. Papers that relate to the present, past, or future practice of the health professions in North Carolina are especially pertinent, but manuscripts reflecting other perspectives or topics are welcomed. Prospective authors should feel free to discuss potential articles with the editors.

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Submit a cover letter and a 3 1/2-inch computer disk that contains the text written in MS DOS- or Macintosh-compatible format. *Also enclose three hard copies of the text for review purposes.* Double space text with one-inch margins. *Please do not "format" the text* (e.g. no variations in type size, no bold face, no italics, no embedded endnotes).

Submit photographic illustrations, in duplicate, as high-quality color 35mm slides or 5-by-7 or 8-by-10-inch glossy prints, or as black-and-white glossy prints (5-by-7 or 8-by-10-inch). Label all illustrations with author's name, number them sequentially according to their position in the text, and indicate the orientation of the images, if necessary. *Do not write directly on the backs of prints.* This can damage them. If figures require printing in four-color process, we may ask the author to pay printing fees or a portion thereof.

Submit tables, charts, and graphs as hard copy *and* include copies on disk, in their original format *and translated as TIFF, PICT, or EPS documents.* Type all figure legends separately. Type and double-space all tables, one to a single sheet of paper. Tables must have titles and consecutive Arabic numbers.

Keep references to a minimum (preferably no more than 15), retaining those that document important points. The "Uniform Requirements" cited above contain reference format. We customarily list the first three authors for "et al"-type references. Authors are responsible for the accuracy and pertinence of all citations.

Avoid abbreviations entirely if possible; keep them to a minimum if not. When used, completely define abbreviations at the first point of usage in the text.

Manuscript Review and Editing

A medically qualified editor reads all manuscripts and, in most instances, sends them out for further review by one or more other members of the North Carolina Medical Society. *Authors' cover letters must include a line that states that their submitted manuscripts are not under consideration for publication elsewhere. It is not the Journal's policy to reprint previously published articles.* Decisions to publish or not are made by the editors, advised by the peer reviewers.

We encourage a relatively informal writing style since we believe this improves communication. Imagine yourself talking with your unseen audience—as long as this doesn't lead you to scientific or linguistic inaccuracy. Be brief, clear, simple, and precise.

We edit accepted manuscripts for clarity, style, and conciseness. Except for letters, authors receive a copy of the edited manuscript for their review and approval before publication. Manuscripts not accepted will not be returned.

Authors retain copyright to articles published in the *North Carolina Medical Journal*, but the North Carolina Medical Society copyrights the contents of each entire issue. Requests for permission to reprint all or any part of a published article must be submitted in writing to the address below and negotiated with the author and editor jointly. Reprinted material must carry a credit line identifying that it appeared in the *North Carolina Medical Journal*.

Submissions

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Letters to the Editor ✍

3 Cheers For Health Watch

Editor's note: Publication of Health Watch was suspended, as of the May/June *Journal*, in part because of the difficulty in obtaining appropriate articles for the section. On page 213 of the July/August issue, Deputy Editor Dr. Ed Halperin asked readers to comment about whether the section should be continued. We welcome additional responses.

To the Editor:

I have been a big fan of the *North Carolina Medical Journal* for a long time. Health Watch is a useful adjunct, and I usually read it to see if it will be useful for my patients.

I'd be willing to write a feature on stroke. Recently, the American Heart Association promulgated a public campaign to increase awareness of stroke's signs and symptoms, and to encourage the public to immediately seek medical care. I could write a patient-oriented piece about stroke, using the AHA guidelines, and enliven it with some demographic statistics about stroke in North Carolina.

J. Griffith Steel, MD
East Carolina Neurology
2501 Stantonsburg Road
Greenville, NC 27834
griff@greenvillenc.com at Internet

To the Editor:

I work for the Buncombe County Medical Society in Asheville, and regularly book physician-written health articles for our local newspaper. Periodically, I send some of these to the Communications Department at the Medical Society. Two of these have been included on the NCMS website.

I would be willing to send the *Journal* articles for Health Watch. I feel that the section is beneficial.

Kristi Brown
Buncombe County Medical Society
530 Hendersonville Road
Asheville, NC 28803
bcms@ioa.com at Internet

To the Editor:

I was discouraged by the suggestion that perhaps the *North Carolina Medical Journal* might no longer be directed to physicians and their patients for lack of submitted patient education articles or materials. I, for one, have enjoyed the Health Watch inserts, and distribute them as "continuing education" to nursing staff and "patient information" to patients. Written in plain, understandable language, these inserts often serve to demystify an illness or condition, making practical suggestions for management along the way.

Line me up with those who say "keep this feature." Perhaps, though, the question might be better posed as "who could best write these inserts?"

I suggest we acknowledge the field of health education, and not ask phsyicians to write Health Watch, but educators. There are scores of talented educators within our communities, our offices, our public agencies, and our universities who would love to use this forum to reach physicians, their office staff, and the public.

Peter J. Morris, MD MPH
Medical Director, and Director,
Family and Youth Success
Wake County Human Services
pmorris@co.wake.nc.us at Internet

Pilot Hopes to Make Program Take Flight

I am a pilot who wants to create a nonprofit organization that caters to children with cancer. I am trying to purchase a World War II fighter plane such as an T-6 or T-28. My goal is to create a program where kids who have undergone treatment but who are losing their battle with cancer could take a wonderful flight in an authentic war bird. I have saved $50,000, but need at least $100,000 to get the program going.

Do you or your readers know of any other similar programs available? My brother-in-law, a West Point helicopter pilot, died after a 5-year battle with brain cancer. My personal mission is to make this work.

Steve Giuffrida
4512 Rolling Green Lane
Tampa, FL 33624
steveg@mail.federation.net at Internet

From the Editor:

Any *Journal* reader willing to help or who may know about a WWII fighter plane for sale may write or e-mail Mr. Guiffrida.

Flying Doctors of America (http://home.navisoft.com/vip/flyingdoctorsofamerica.htm), recruits physicians, nurses, and other health care personnel and flies them to remote areas of the world to help poor people in need of medical assistance. Granted, Mr. Guiffrida's proposed program is different, but we've referred him to this group in hopes he can gain insight into such a venture.

Striving for Excellence: A Message Worth Repeating

To the Editor:

I applaud the article by Dr. Dan Blazer that appeared in the July/August *Journal* (NC Med J 1998;59:262-3). I recommend that all medical schools give all graduating classes a copy. I also recommend that all physicians get a copy and read it at least every 5 years.

I'm retired, but I sure do enjoy reading each issue of the *Journal.*

J. David Stratton, MD
5100 Sharon Road #100
Charlotte, NC 28210-4799

To the Editor:

Dan Blazer's essay, "Striving for Excellence: A Neglected Challenge to Young Physicians" (NC Med J 1998;59:262-3), took me on a quick tour of the vast landscapes of all great religious teachings of the world. It reminded me that the central theme of these stunning sceneries is a simple message: not to be satisfied with competence, and constantly strive for excellence. Maybe pursuit of excellence should be our religion, or at least a significant part of it. I regret that we no longer teach excellence to our children, by word and deed, from the playgrounds of kindergarten to the halls of institutions of higher learning.

Assad Meymandi, MD, FAPA
Journal Editorial Board member
3320 Executive Drive, Suite 218
Raleigh, NC 27609
ammdfapa@aol.com at Internet

Managed Care Revisited

To the Editor:

I was very impressed that the *Journal* published the statement of the Bioethics Committee of the North Carolina Medical Society (NC Med J 1998;59:96-100). It's good to hear that there are other physicians who are very disturbed by the sell-out of the medical profession to the insurance companies and government. I particularly liked the reference to the "sacredness" of the physician-patient relationship that must be founded on mutual trust. This trust cannot exist when physicians are obligated contractually to give a higher priority to the insurance company's profits before the patients' health care interests.

The Committee's prescription for a remedy sounds a lot like medical savings accounts, which I wholeheartedly support. I also liked the Committee's renewed call for physicians to provide some pro bono care to those who cannot afford the high cost of care. Those physicians who have been captured by managed care are often not free to offer such care without putting themselves at risk for "deselection." Thank you for printing thoughtful and timely recommendations.

Philip Matthews, DO
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16260 NE 85th St.
Redmond, WA 98052
p.matthews@juno.com at Internet

To the Editor:

I read with great interest the statement of the Bioethics Committee of the North Carolina Medical Society (NC Med J 1998;59:96-100) on the medical profession's role in a managed care environment. I find myself in almost total agreement with the points that were made. I agree with the fundamental principles, but the second section [on the current state of the managed care environment] should also include a position on medical savings accounts, as well as individuals' ability to purchase health insurance with pre-tax dollars.

Bravo! Keep up the pressure.

Robert V. Plehn, MD, DABA, FACA
Louis Smith Memorial Hospital
852 W. Thigpen Ave.
Lakeland, GA 31635
effie@surfsouth.com at Internet

To the Editor:

In the July/August *Journal*, Dr. James Weaver asks "where is the proof" of my assertion that if preventive health care were not funded, many people would defer getting medical care (NC Med J 1998;59:210).

During the past several years, there has been extensive documentation of this point. For example, the 1993 Behavioral Risk Factor Surveillance System looked at the relationship between health insurance coverage and the receipt of preventive health services. It found that people without health insurance were less likely to get important preventive services such as Pap smears, mammograms, cholesterol screening, and digital rectal exams.[1] A 1995 *New England Journal of Medicine* article showed that women on Medicare who lacked supplemental insurance were less likely to get mammograms than women with supplemental insurance. The author concluded that "requiring copayments for preventive services is an obstacle to the effective mass screening of older women for breast cancer."[2]

Findings regarding uninsured children are similar. An analysis of the 1988 Child Health Supplement of the National Health Interview Survey showed that uninsured children do not get as much preventive or sick care as insured children.[3] Another study showed that uninsured children were less likely to get care for pharyngitis, acute earache, recurrent ear infections, and asthma than insured children.[4]

Jessica Schorr Saxe, MD
901 N. Alexander
Charlotte, NC 28206
saxe@charlotte.infi.net at Internet

References

1 Health insurance coverage and receipt of preventive health services—United States, 1993. MMWR 1995;44:219-24.
2 Blustein J. Medicare coverage, supplemental insurance, and the use of mammography by older women. N Engl J Med 1994;332:1138-42.
3 Hall JL. Profile of uninsured children in the United States. Arch Peds Adol Med 1995;149:398-406.
4 Stoddard JJ. Health insurance status and ambulatory care for children. N Engl J Med 1994;330:1421-30.

From the Editor:

Dr. Saxe's letter brings to a close our discussion on the statement of the Bioethics Committee. The articles that she cites demonstrate a link between fund availability and preventive health care, but by themselves they do not demonstrate that this is a cause and effect relationship. Until new studies are available, it's time to let this issue rest.

Journal Articles Get Around

Editor's note: The *Journal* receives many requests for information on, or permission to reprint specific articles. We publish a few of the more interesting requests here to let readers know where else the *Journal* raises interested eyebrows.

To the Editor:

I am a palliative care doctor in a hospital-based palliative care service in Queensland, Australia. We have a patient at present who has non small-cell lung cancer, and has developed a colocutaneous fistula as an early (2-week) complication of percutaneous gastrostomy. Medline shows that your journal recently published an article on this complication (Smith SE, Clancy TV. Colocutaneous fistula: a rare complication of percutaneous gastrostomy. NC Med J 1998;59:80-2). Could you please provide me with the full text of the article?

Peter Whan, Senior Medical Officer
Palliative Care Service, Redcliffe Hospital
Dept. of Social and Preventive Medicine
University of Queensland
Redcliffe, Queensland 4020, Australia
p.whan@uq.net.au at Internet

To the Editor:

I noticed through your web page (http://www.ncmedicaljournal.com) that you sell back issues. Do you also provide reprints of specific articles? Is there any library that gives full text over the Web? Your journal is not available over here.

Karen Sroussi
Soroka Medical Library
Ben Gurion University of the Negev, Beer Sheva, Israel
ksroussi@bgumail.bgu.ac.il at Internet

To our readers (and Ms. Sroussi):

Photocopies of any article in any issue are available, either by fax or mail. Text from articles in recent issues (January/February 1997-present) also can be e-mailed.

Many libraries subscribe to the *Journal,* but none are authorized to publish our material over the Internet. Anyone can purchase a subscription. Cost is $20 per year. Send check or money order to: North Carolina Medical Society, P.O. Box 27167, Raleigh, NC 27167-7611, Attn: *Journal* subscription.

To the Editor:

Could you please send the text of the article, "Injuries Associated With Personal Watercraft: An Emerging Epidemic in Need of Legislative Action," from your July/August 1997 issue (NC Med J 1997;58:284-7)? We are conducting research on the legislative issue and we would like to refer to this scientific investigation of the safety issue.

Peter O'Toole
SAIL Magazine
sail@channel1.com at Internet

To the Editor:

I am a graduate student at the University of Oregon. I would like to request a copy of the article, "Let's Abolish the Office of Alternative Medicine of the National Institutes of Health" (NC Med J 1998;59:21-6).

Jolinda Smith
University of Oregon
Department of Journalism
jolinda@darkwing.uoregon.edu at Internet

To the Editor:

Please provide me with a copy of the article, "The North Carolina Trauma System," from the July/August 1997 special *North Carolina Medical Journal* on emergency medicine (NC Med J 1997;58:245-7). Thank you.

Allen Pearman, MD
Emergency Medical Services, Department of Health
2002 Old St. Augustine, Bldg. D
Tallahassee, FL 32301-4881
Allen_Pearman@doh.state.fl.us at Internet

To the Editor:

I recently saw on your web page a summary of the contents of the July/August *North Carolina Medical Journal.* I was particularly impressed and interested in the article by Dr. Mark Swaim about Sister Elizabeth Kenny's polio treatment (NC Med J 1998;59:256-60). I would like permission to link the full text to my website, Post-Polio Syndrome Central. The site, at http://angus.interspeed.net/ppsc/lists, is a comprehensive list of resources for patients with post-polio syndrome. Thank you.

Cleo Kiernan
angus1@cris.com at Internet

From the Editor:

The *Journal* and Dr. Swaim have granted Mr. Kiernan permission to link the article to his website. Readers can find this particular link at: http://angus.interspeed.net/ppsc/swaim.html

Correction

There is an error on page 233 of the July/August issue, in "Preventing Childhood Poisoning" (NC Med J 1998;59:233). Under Results, seventh line of the second paragraph, the number "7" appears as a footnote. This sentence should read, "...7 stated they would look for the number in the phone book or call information...." We regret the error and miscommunication it may have caused.

Condition: Critical! Opportunity: Fleeting!

The Editorial Board Speaks to Readers of the Journal

For the first time in the *Journal*'s nearly 60 years of existence, the Editorial Board has chosen to communicate directly to *Journal* readers by way of an editorial. This could be the only time that we do so, because the next issue of the *Journal* may very well be the last.

We are in dire straits. On June 9, 1998, the Editor received a letter from NCMS President Dr. Charles Garrett Jr. (with copies to members of the Editorial Board). The letter states "The North Carolina Medical Society has been in the process of developing the new 1999 Strategic Plan for next year. This new Strategic Plan will require that we use nearly all available resources to address the issues which have been identified to be top priorities for the North Carolina Medical Society. Some of these priorities include, but are not limited to, tort reform and managed care.

"In order to effectively address these highly controversial topics within the General Assembly, the North Carolina Medical Society will require as much staff and financial support as possible. It is for this reason that the Executive Council has passed the following action item: Resolved, that the publication of the *North Carolina Medical Journal* be suspended effective January 1, 1999.

"Please know that this action item did not pass because of the quality of the *Journal* or your staff. The North Carolina Medical Society is grateful for the extraordinary work that you and your staff have performed. Unfortunately, the Executive Council recognizes the limited resources available to us and that we must prioritize them to ensure we are meeting the needs of our membership."

The Editorial Board believes that this action raises these fundamental questions:

1) Just how much money will become available to the Executive Council by suspending publication of the *Journal*?

2) Does the money saved justify suspension of the publication?

3) What is the fundamental issue here?

Now for the answers:

1) This question can be answered factually. The Society expends a net of about $105,000 per year (roughly $13 for each of its 7913 dues-paying members) to print and publish the *Journal*.

2) This a matter of judgment. We believe that a *learned* profession has a profound responsibility to its members and to society at large to provide a forum where ideas can be developed, exchanged, and promulgated. The Editorial Board subscribes to this view, and, according to Dr. Garrett's letter, the Executive Council does too!

We believe that the North Carolina Medical Society, the state's formal embodiment of our noble and learned profession, *cannot afford* to do away with its forum, the *Journal*. The Executive Council rightfully must be concerned with contemporaneous issues, but it is our view that the money required to do so effectively should come from other sources. Political success does not—and must not—depend on cannibalizing the profession's intellectual offspring.

3) In our judgment, the fundamental issue raised by the Executive Council's action is whether the North Carolina Medical Society has a responsibility to its members that far exceeds its role as a political action committee.

Dealing with managed care and government regulation is important, but should our Society ever deteriorate to mere union or guild status, it will not be because of managed care and government regulations. It will be, rather, because we ignored or forgot the higher calling to be *all* that is fundamental to a learned profession.

We ask readers who agree with us to let their county delegates know about the proposal of the Executive Council. We ask those readers and their delegates to attend the Annual Meeting on November 12-15, so that the resolution, when brought before the House of Delegates, can be defeated.

Carpe Professio!

Eben Alexander Jr, MD
William B. Blythe
E C Halperin
Cynthia A. Hampton, MD
Johnson Kelly
Patrick D. Kenan
Ronald B. Mack, M.D.
William G. Porter
Mary J. Rose MD
C. Stewart Rogers
James P. Weaver

Editorial Board members and Associate Editors

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An Editorial Counterpoint

by F. Maxton Mauney, Jr., MD, Journal Associate Editor

The May 31st action of the Executive Council to submit a resolution to the Annual Meeting of the North Carolina Medical Society's House of Delegates that recommends suspending publication of the *North Carolina Medical Journal* as of December 31, 1998, has, understandably, not been well received by the Editor, the contributing and associate editorial group, nor any persons or organizations that are paid to produce this outstanding publication. I am also confident that there is a hard core group of *Journal* readers who are shocked by this action.

As a long-standing supporter of, and a minor contributor to the *Journal* as Associate Editor, I share the angst of those who are mounting an effort to defeat the Council's resolution. Indeed, I greatly admire the scholarly work and personal sacrifice provided by my colleagues, friends, and even a classmate whose names have appeared on the masthead for a long time. I also appreciate the hundreds of contributing authors whose articles I have enjoyed reading.

This Editorial Board met recently for an urgent meeting that I was unable to attend due to a personal travel conflict. Subsequently, the Managing Editor sent me an informational packet containing the Executive Council's resolution, a summary of the Editorial Board's discussion at their meeting and the draft of a resolution opposing suspension that the *Journal* group hopes to have introduced by several large component medical societies. There also was a draft of the editorial, which is published in this issue. I chose to withhold my signature from this editorial.

Why would I do such a thing? In the past, when the question of whether to discontinue publication of the *Journal* was debated (and the question comes up every few years), I have spoken firmly in support of the *Journal* and of even providing more support. However, that was in the past. Ladies and gentlemen, the milieu of our profession today does not even resemble the recent past. Change has been paramount as we constantly strive to adapt, to resist, and to change as needed to maintain the autonomy of the profession and the special relationship of patient and doctor. The issue then is can we afford to continue the status quo with regard to our communication dollars?

Furthermore, one must consider the process by which this difficult resolve was reached. The elected leadership of any voluntary organization strives constantly to stay in touch with those who are tangibly supporting its goals and objectives. This has been a major effort of the Medical Society leaders and staff, especially during the past few years. This past winter and early spring, there was a backbreaking effort to visit small and large communities from Manteo to Murphy. The input from those (and prior) focus group contacts with our membership were organized and presented to the Long Range Planning Committee that met over several days this spring. This large and representative cross-section of our members (rank and file, younger and older physicians, men, women, generalists, specialists, and past leaders) labored diligently to come to an understanding of what was currently most important and vital to our members. Their carefully constructed and prioritized strategic plan went to our elected officers and Executive Council for more deliberation.

After the broadest possible input in this time of perilous threats to the profession, with serious threats to our freedom to deliver quality health care to patients, and at a time when our capacity to be strong patient and professional advocates is crucial, the Medical Society's elected officers and Executive Council have determined that a reallocation of the Society's finite resources is necessary. I am compelled to respect that decision. As a past president of this organization, I am very aware of how difficult decisions of this magnitude can be. I have the utmost respect for the process and am delighted that the Council has chosen to place the question before the House of Delegates. In my opinion, that is where the final debate belongs. After hearing the pros and cons, I will make my final decision and cast my vote accordingly.

Finally, the operative word is *suspend*. Not for a moment do I believe the leadership wants to *destroy* our journal. Indeed, there is plenty of time for those who view the *Journal* as vital to "professionalism" or "intellectualism" and who think that it is well valued at its current subsidized cost, to come up with a business plan and subscription base that will provide for continued publication. I will forward my personal check to the Editor to support that effort and pledge my best efforts to help. This is a far more palatable alternative for me than the Editorial Board telling us how we should best spend our limited dollars. This is what the special editorial is attempting to do, and I do not agree with the arguments presented.

I await the House of Delegates' deliberations with great interest and will abide by their wisdom, whatever the outcome.

Why the NC Medical Society Needs a Journal

A Note from Editor Francis A. Neelon, MD

The preceding communications (one from the Editorial Board and a contrary opinion from Dr. Mauney) reflect clearly the present quandary in which the *Journal* and the Society find themselves: What business does a state medical society have spending even a small amount of its precious resources in publishing a professional journal?

I believe that the *Journal* serves a number of important functions, ones that will be lost (perhaps irretrievably) if the Society members accede to the recommendations of the leadership and "suspend" publication of the *Journal*. Indeed, "suspension" itself is an interesting idea, since it will entail dismantling an infrastructure that we have built up over the past 15 years. We will have to let go an outstanding Managing Editor, give up the virtually rent-free offices we now occupy, disperse the equipment and talent that we have assembled. In theory, we could interrupt the "suspension" before asphyxiation occurs, but I doubt that will happen. "Suspension" will mean extinction, no doubt about it.

What will we lose if this independent, peer-reviewed voice of the doctors of North Carolina goes silent? We will lose much of the historical record of contemporary medicine in North Carolina. There are other venues for publication, but they do not have the same keen interest in the nature of medical practice in this state that we have. Future observers will find the historical record impoverished if they do not have the information now recorded in the *Journal*. It is a good thing for the Society to invest a fraction (and the *Journal*'s yearly budget is a tiny fraction) of its yearly expenditures in maintaining and enlarging the historical record.

We will lose a forum at which the doctors of North Carolina can raise their voices, pro and con, about the issues that intrigue or excite or vex them. The *Journal* is a venue for debate and opinion and insight, not by distant "experts," but by NC practitioners themselves. There is no other means for such communication by practitioners, for practitioners at present visible to me or (the Internet notwithstanding) in the future. I have always been pleased that nearly half of the papers we publish each year come from clinicians with no academic affiliation, whose only reason for writing is to communicate with their colleagues. On the other hand, the rest of our papers come from physicians at the state's four medical schools. The *Journal* is an important resource for them, and a way of keeping the rest of us abreast of what they are up to; if we lose the *Journal*, we will lose one feature that makes the Medical Society attractive to academics.

We will lose an opportunity for encouraging our students and residents to become more fully and deeply involved in their self-education if we discard a place in which to publish the papers that they write. The importance of this function is shown in the papers by Wixon on page 314 and by Loeser on page 318. There is more to learning than just reading and listening; there is abundant merit in writing what one has learned for the sake of others. Having a way to publish those writings is a strong stimulus and reward for young doctors. When Harvey Cushing retired after 20 years as Hersey Professor of Surgery at Harvard, he said his only regret was that he had not succeeded in establishing there a journal like the *Bulletin of the Johns Hopkins Hospital* where young doctors could "cut their teeth" as writers. We have such a vehicle. It is important and there are precious few like it. It is a very good thing that the North Carolina Medical Society supports and underwrites this activity. In doing so, it undergirds and buttresses the very future of medicine.

Because the *Journal* is listed in Index Medicus, the doings and writings of North Carolina doctors get known across the country and around the globe (look at the Letters on page 277 for examples). This is a kind of publicity the Society could not reproduce at any cost, and at the same time it provides an invaluable public service. It is the kind of important and irreplaceable service to the profession at large that the Society ought always to undertake. The papers the *Journal* now publishes will not easily find their way into print elsewhere; without the *Journal* they will be lost forever. That would really be too bad.

Finally, the very fact that it publishes a professional journal says something about the Society, about the kind of organization it is, about what it aspires to be. It makes tangible the commitment to "unite, serve, and represent physicians" that is the stated mission of our Society. It says, in a way that no other Society activity does or can, that we are no mere band of artisans (though art is important to us), nor only a politically active pack, alert only or mainly to financial and political expediency, nor just a social conclave. It says that we are more than this, that we are members of a learned profession, possibly the oldest of all, nurturing a tradition of care and inquiry and concern that goes back through the millennia. Without a *Journal* the North Carolina Medical Society will become small, concentrating on its narrow self-interests and failing its larger duty to fly the standard for our profession. Without the stimulus of the *Journal*, the Society—and by extension all its actual and potential members—will be the poorer. Let's not let that happen.

Environmental Tobacco Smoke Regulations Have Not Hurt Restaurant Sales in North Carolina

Adam O. Goldstein, MD, and Rachel A. Sobel

The US Environmental Protection Agency, on review of available scientific evidence, has concluded that exposure to environmental tobacco smoke (ETS) causes serious and substantial health problems in this country.[1] In 1992, the EPA declared tobacco smoke a Class A carcinogen, in the same category with asbestos, radon, and benzene. Exposure to ETS causes an estimated 3000 lung cancer deaths per year and a variety of respiratory illnesses in nonsmoking adults.[1] Even more troubling, recent research shows that ETS causes heart disease. This means that there are 10-20 times as many ETS-related deaths from heart disease as from lung cancer.[2] This toxic legacy is not surprising; ETS contains more than 4000 chemicals, 200 poisons, and 43 carcinogenic compounds.[1,3]

As we have become more aware of the harmful effects of tobacco use, many US communities have implemented ordinances to regulate smoking in workplaces and public places, including restaurants. Restaurateurs and restaurant associations have challenged these regulations by claiming that ETS ordinances cause economic damage to their business.[4,5] Although such claims have been contradicted by several studies showing that ETS regulations do not have a negative economic impact,[4,6-10] claims of lost revenue persist,[4,5] hindering informed debate and the passage of strong ETS regulations. These claims are particularly common in tobacco-producing states, but in those states there has been no comprehensive examination of the economic impact of ETS ordinances on restaurant sales.

In 1989, the city of Greensboro passed the first significant ETS legislation in North Carolina.[11] Several communities followed suit, prompting the tobacco industry to sponsor legislation in the 1993 NC General Assembly intended to preempt or prevent local communities from passing regulations more stringent than the proposed statewide law. The law, HB957, which passed in July 1993, contained no health measures to protect the public from ETS exposure, but it gave a 3-month window during which communities could adopt their own regulations. In that short time, 27 Boards of Health, 21 County Commissioners, and 41 City Councils passed 89 ETS regulations.[11] Previous studies have assessed the processes by which these ETS regulations were passed, the politics leading to passage, and the degree of public health protection from ETS exposure they provide.[11,12] To evaluate tobacco industry assertions about the negative effects of ETS ordinances, we looked at the economic impact of these ETS regulations on restaurant sales and the resultant political consequences.

Methods

The various ETS ordinances passed by North Carolina counties and communities differ in the degree of protection they offer.[12] We examined the impact of ETS ordinances on restaurant sales only in counties with stringent ETS ordinances that had been passed by Boards of Health because such Boards maintain countywide jurisdiction. The Boards of Health all adopted at least 33% nonsmoking areas in restaurants, increasing the amount of restaurant area covered to 80%-100% within 1-2 years in most cases. For comparison, we examined counties that did not have any restaurant ETS ordinance during the study time. We matched counties with and without an ETS ordinance on the basis of population, per capita income, and acres of tobacco harvested; we analyzed the 5 best matches (Table 1, next page).

Data on county restaurant and gross retail sales were obtained from the NC Department of Revenue, Tax Research Division, for 6 fiscal years from 1990-1991 through 1996-1997 (data for fiscal year 1991-1992 were unavailable). The NC Department of Revenue is an objective and consistent data collector and collects economic information from all eating establishments in a county, not just a random sample.

Following the model of Glantz and Smith,[4] population growth, inflation, and changes in underlying economic conditions were accounted for by computing the fraction (F) of total retail sales represented by restaurant sales (F= restaurant sales/

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total retail sales). If an ordinance adversely affects restaurant sales, F will drop after the ordinance goes into effect. We also compared restaurant sales in cities with an ordinance to those in cities without an ordinance by calculating the ratio (C) of sales in paired counties (C= restaurant sales in counties with ordinance/restaurant sales in counties without ordinance). If an ordinance adversely affects restaurant sales, C will drop after the ordinance goes into effect. Significance of differences over time in F and C were tested using paired t-tests, along with regression analyses according to the model of Glantz and Smith.[4] Models were adjusted to account for varying dates and degrees of implementation.

Results

The 5 counties with strong ETS ordinances and the 5 without each had a combined population of over 900,000 (thus accounting for about 30% of the state's population). These counties included both tobacco producing and nonproducing areas, but 3 of the 5 ordinance counties harvested more acres of tobacco annually than the matching nonordinance counties (Table 1).

Table 2, below, summarizes the findings relative to F, the fraction of restaurant sales to total retail sales. There was little fluctuation in F over the five fiscal years in counties with and without ETS ordinances. The mean value of F in counties with an ETS ordinance (9.1) was higher than the mean value of F in counties without an ETS ordinance (8.3). The standard deviation of the means of F were quite small both in counties with and without ETS ordinances, indicating relative homogeneity in restaurant sales over the study period. Counties without ETS ordinances showed increases and decreases similar to those in matched counties with ETS ordinances.

Table 3, next page, summarizes the results of the ratio (C) of restaurant sales in cities with an ordinance to restaurant sales in cities without an ordinance. There were no consistent changes in restaurant sales after the ETS ordinances took effect.

Paired t-tests showed no significant difference in combined restaurant sales in the 10 counties for fiscal years 1990-1991 and 1992-1993, prior to the ordinances, compared to sales for fiscal years 1994-1997, following implementation of the ordinances. There also

Table 1. Demographic summary of NC counties with and without restaurant smoking ordinances

County	Restaurant tobacco ordinance	County population	Per capita income	Unemployment rate 1990-1996	Tobacco acreage
Craven	yes	85,518	$16,979	6%	4,530
Rockingham	no	88,414	$16,979	6%	6,030
Halifax	yes	57,497	$14,587	8%	3,060
Brunswick	no	60,795	$14,834	9%	1,690
Orange	yes	107,648	$21,945	3%	1,590
Cabarrus	no	110,030	$18,799	4%	0
Wake	yes	513,639	$23,959	3%	9,930
Mecklenburg	no	579,473	$24,612	4%	0
Buncombe	yes	189,506	$19,355	4%	1,150
Davidson	no	135,373	$17,153	4%	1,540

Sources: US Bureau of the Census, 1996; NC Department of Labor, 1996; NC Dept. of Agriculture, 1992

Table 2. Percentage of restaurant sales as a fraction of gross retail sales

County	1990-1	1992-3	1993-4	1994-5	1995-6	1996-7	Mean (SD)
Craven*	9.8	10.1	9.1	9.0	8.6	8.1	9.1 (0.7)
Rockingham	9.7	8.9	9.1	9.4	9.0	8.0	9.0 (0.6)
Halifax*	8.4	8.9	9.6	9.0	8.7	7.7	8.7 (0.6)
Brunswick	12.0	12.3	11.5	11.3	10.9	10.3	11.4 (0.7)
Orange*	10.6	11.1	10.7	10.5	10.9	11.0	10.8 (0.2)
Cabarus	6.7	7.6	7.6	7.2	7.4	8.1	7.4 (0.5)
Wake*	8.0	8.2	8.2	7.8	7.4	6.9	7.8 (0.5)
Mecklenburg	6.5	6.2	6.7	6.5	6.1	5.9	6.3 (0.3)
Buncombe*	9.0	9.3	8.8	8.7	8.3	7.7	8.6 (0.6)
Davidson	7.1	6.7	7.3	7.4	6.6	6.4	6.9 (0.4)

*Counties in which restaurant smoking ordinances were enacted in 1993 were no statistically significant differences by regression analyses and the coefficients for F or C.

Discussion

Our data show that implementation of stringent ETS regulations had no adverse economic impact on restaurant sales in 5 North Carolina counties. These findings are consistent with those from other communities,[4,6,7-10] and are not the first to show the absence of negative effect from ETS regulations in a major tobacco producing state. Our findings confirm 2 small telephone studies conducted in Wake and Orange counties to determine the impact of their local ordinances. In both counties, a majority of restaurant owners or managers said that their county's ETS ordinance had no negative economic impact on their business.[13,14]

Major tobacco-producing states have generally resisted comprehensive ordinances regulating ETS exposure.[11,15] For instance, at the beginning of 1993, Kentucky, North Carolina, South Carolina, Georgia, and Tennessee had passed a total of only 11 local ETS ordinances, and few of them offered significant public protection from ETS exposure.[15] By October 1993, North Carolina communities had passed a total of 89 ETS ordinances in response to preemption legislation passed by the General Assembly.[12]

The rights of Boards of Health to pass ETS regulations have been threatened. In December 1996, the NC Court of Appeals invalidated the Halifax County Board of Health ETS ordinance because the ordinance had granted exceptions to the regulations based on perceived economic harm to smaller restaurants or because of difficulty in enforcement.[16] The Court of Appeals recognized the authority of a Board of Health to pass ETS regulations, but denied it the authority to create exceptions unless they are based on public health. Rulings in New York and Ohio also state that a Board of Health can regulate ETS exposure in public places but cannot create exceptions to an ETS ordinance based on non-health related concerns.[17]

The NC Court of Appeals decision affected not only Halifax but all counties with similar Board of Health ETS ordinances. By February 1997, 14 Boards of Health had suspended enforcement of their ETS regulations, 7 were undecided on their course of action, and only 5 were attempting to uphold their ordinances (personal communication, J. Barnhardt, 9/24/97). Most said they needed legislative action to enable them to redress the issue because the 1993 statewide preemption bill (HB957) currently prevents them from adopting new ordinances. Now, virtually all NC Board of Health regulations have been suspended, or left on the books with no enforcement.

Thus, ironically, HB957, which was the impetus for communities throughout the state to adopt ETS ordinances, now prevents them from protecting citizens from exposure to ETS. HB957 prevents North Carolina communities from working toward stronger, more protective regulations; the majority of health ETS ordinances passed by county boards have been invalidated and Boards of Health are prevented from passing regulations to replace those annulled by the Halifax County Court of Appeals decision. The lack of statewide or significant local ETS regulations presents a clear danger and challenge to public health.

Conclusion

Until recently, ordinances in many North Carolina counties provided protection from ETS exposure in workplaces and public places, including restaurants. Our research shows that this protection resulted in no adverse economic effect on the restaurant industry. Even in the number one tobacco-producing state in the US, ETS regulations present no adverse economic impact, and there is no need for exceptions to the ordinances based on such fears. Now we must ask our legislators to muster the political will to enact such legislation. ❑

Table 3. Ratio of restaurant sales in counties with to those without restaurant smoking ordinances

Counties	**1990-1**	**1992-3**	**1993-4**	**1994-5**	**1995-6**	**1996-7**
Craven*/Rockingham	1.19	1.33	1.23	1.17	1.16	1.24
Halifax*/Brunswick	.80	.75	.77	.74	.71	.63
Orange*/Cabarus	1.46	1.31	1.22	1.25	1.18	1.09
Wake*/Mecklenburg	.74	.85	.79	.81	.80	.76
Buncombe*/Davidson	2.77	2.97	2.94	2.96	3.22	3.05

*Counties in which restaurant smoking ordinances were enacted in 1993

Combined data†						
Restaurant sales	.97	1.08	1.00	1.01	1.00	.94
All retail sales	.79	.81	.82	.84	.82	.84

†All counties with a restaurant smoking ordinance enacted in 1993/all counties without

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Impact of Smoking Control Rules on Restaurants in Orange County, North Carolina

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Communities across the United States have implemented ordinances to regulate smoking in workplaces and public places. In some communities, restaurant groups (often associated with or sponsored by the tobacco industry) have challenged these ordinances, claiming that ETS regulations decrease their business. Several studies have shown that ETS ordinances do not adversely affect the restaurant industry, but such claims persist.[1-7] We present here the first data on the effect of regulating ETS in restaurants in a tobacco-producing county in a major tobacco producing state.

On October 14, 1993, one day before a bill (sponsored in the General Assembly by the tobacco industry) that would preempt the ability of local jurisdictions to regulate smoking[8] came into effect, the Orange County Board of Health prohibited smoking in public places, workplaces, and county and state prisons. In addition, all eating establishments with 30 seats or more were required to become smoke-free or to designate separate, fully contained smoking areas with a separate and adequate heating, ventilation, and air conditioning system.[8]

The Survey

Prior to implementation of the Smoking Control Rules, we surveyed (Survey 1) local restaurant owners and managers to gauge their attitudes toward the Rules, and their plans for compliance. We contacted a random sample of 65 of 121 county restaurants (whose food service ranged from fast food to fine dining, and seating capacity from 20-300). In 95% of the cases, an owner or manager responded. In January 1997, 58 (89%) of the original 65 restaurants participated in a follow-up survey (Survey 2). In 90% of the cases, an owner or manager also completed the follow-up survey.

The surveys addressed three main issues: compliance, perceptions of economic impact, and customer support. Before implementation of the Rules, only 29% of the participating restaurants were 100% smoke-free; in January 1997, 67% were completely smoke-free, 28% had installed a separate ventilation system, and 5% were not complying. In Survey 1, 49% of respondents stated that they anticipated no economic impact from the Rules on their business, while 33% anticipated a negative impact. In Survey 2, 18 months after implementation, 60% said that the Rules had not affected their business, and 22% said that they had a negative economic impact. In both surveys, 60% of respondents said that their customers supported the Smoking Control Rules.

Conclusions

Our survey demonstrates that between 1995-1997, most of the eating establishments surveyed in one North Carolina county became smoke-free or installed a separate ventilation system, even though there were no active efforts to enforce the ordinance. In Surveys 1 and 2, a majority of restaurant owners or managers discounted any economic impact from the Rules and said that most of their customers supported the Rules. Based on these results, it appears that the Orange County Smoking Control Rules have significantly improved risk protection for employees and citizens in Orange County eating establishments. Restaurant owners admit that the majority of their customers support such rules and most do not feel their businesses suffered economically, perceptions that are now also supported by data.[9] ❑

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Influenzal and Pneumococcal Immunizations

A Survey of Policies and Practices in North Carolina

Susan Rupp Mims, MD, MPH

Influenzal and pneumococcal infection cause significant morbidity and mortality in older adults.[1] Together they are the sixth-leading cause of death in the United States (more than 82,000 deaths in 1996[2]). Influenzal and pneumococcal disease can be prevented with clinically safe and and cost-effective immunizations.[3,4] The rates at which older adults in the US are immunized against these infections are increasing, but remain below the national health objectives for the year 2000, especially in regard to pneumococcal vaccine.[1] In 1995, 58% of American adults older than age 65 had been immunized against influenza during the preceding year, but only 36% had ever been immunized against pneumococcus. In North Carolina, immunization rates (52% for influenza and 31% for pneumococcus[1]) fall below the national average. Unpublished data from the Centers for Disease Control (CDC) National Nursing Home Survey show that nursing home residents are immunized at rates only slightly higher than patients living on their own (personal communication, Ray Strikas, CDC, Dec. 1997).

Several possible explanations for low use of these vaccines are: 1) physician and patient beliefs about efficacy or adverse reactions; 2) provider concerns about reimbursement and time use; and 3) missed opportunities. The CDC has proposed strategies to improve the use of influenzal and pneumococcal vaccines: 1) assessment of physician practice patterns and patient beliefs; 2) improved vaccine delivery; and 3) collaboration between public and private organizations.[1]

I present here the results of a study I undertook to develop and pilot test a questionnaire for assessing policies and practices related to vaccination against influenza and pneumococcus in North Carolina. I also wanted to assess the status of collaboration between local health departments and private care providers. Information was obtained from health care providers and facilities caring for elderly and high-risk patients.

Methods

I conducted a brief telephone survey to obtain information about adult immunization practices and policies for both patients and employees. Three North Carolina counties were surveyed, representing several demographic characteristics: size of population, location in state, and urban vs. rural environment. Hospitals in all 3 counties serve populations beyond their borders, and therefore survey results actually apply to populations greater than in the counties alone. With input from the 3 local health department directors, I selected a targeted, convenience sample of different types of practices and facilities in an effort to obtain information from the larger organizations in each county.

The survey consisted of 17 questions: 5 about demographics, 7 concerning immunizations of patients or residents, 3 concerning immunizations of employees, and 2 about collaboration with local health departments. Survey results were entered into Microsoft Excel for frequency analysis.

Results

A total of 45 telephone interviews were attempted with 100% response rate. Sixteen each were completed in Durham and Pitt counties, 12 in Jackson County, and one from nearby Buncombe County because a call was transferred there from an associated agency in Jackson County. Information was obtained from hospitals, mental health facilities, skilled nursing facilities, rest homes, shelters, dialysis centers, correctional facilities, private practices and clinics, home health agencies, and local health departments. Size of the facilities ranged from 28 to 1000 beds (median = 107 beds). Private practices con-

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Table. Immunization practices against influenza and pneumococcus in North Carolina

	Yes	No	Unsure
Immunizations of patients and residents			
Routinely ask about adult immunization status	38%	62%	
Provide immunizations	78%	22%	
Give patient a record of immunization	15%	85%	
Influenzal immunization of employees			
Provide written recommendations	38%	62%	
Provide on site influenzal vaccination	82%	18%	
Provide vaccinations free to employees	87%	13%	
Collaboration with local health departments			
Collaborated in past	26%	59%	15%
Receptive to future collaboration	84%	2%	14%

sisted primarily of Internal Medicine and Family Medicine specialties, and one subspecialty (Nephrology). Practice size ranged from 1 to 100 providers (median = 9.5 providers).

The responses to pertinent survey questions are presented in the Table. Responses did not differ by county. Thirty-eight percent of the practices and facilities surveyed routinely ask adult patients about immunization status. Of the organizations that do ask, 94% ask about influenzal and 88% about pneumococcal vaccination. This information is most often recorded on a new patient health history or on an admission form in the patient's chart. Seventy-five percent of the skilled nursing facilities and 60% of the private practices and clinics routinely ask about adult immunizations; none of the hospitals or rest homes did.

Nearly 80% of the interviewed organizations said they provide influenzal and pneumococcal immunizations to their patients or residents, but only 2 of the 7 rest homes did. Where documentation about administered immunizations was kept varied greatly. Less than half of the organizations provide a special section of the chart for either immunizations or preventive services. They instead document the vaccination in a progress note or on the medication record or both. Three organizations use computerized medical records, which record immunizations electronically. Only 15% of the organizations that provide immunizations give a written record of the immunization to patients, but all 3 of the health departments contacted do. No residential facility gave written documentation to its residents.

Only 38% of the organizations contacted provide their employees with written recommendations about immunization for influenza. However, 82% provide on-site influenzal vaccination, mostly free of charge, to employees. Hospitals and skilled nursing facilities were the types of organization most often offering employees written recommendations about influenzal immunization. Rest homes were an exception; none had a policy and less than half offered influenza vaccination to employees.

Less than one-third of the organizations reported prior collaboration with their local health departments on health promotion projects for older adults. However, nearly all said that they would be receptive to future collaboration on immunization programs (one organization said it did not have time or resources for new projects). The 2 shelters I contacted worked closely with their local health department, and had collaborated on at least 1 project in the past.

Discussion

During this project, I developed, refined, and pilot-tested a telephone questionnaire taking less than 5 minutes to complete. The information obtained provides insight into the practices and policies of North Carolina health care providers. Of particular interest is the fact that almost two-thirds of the organizations I contacted do not routinely assess the immunization status of adults. This finding is consistent with other reports regarding the rarity with which immunization status is included in medical records of adults.[5] Unless asked about their immunization status (or they themselves introduce the topic), individuals are unlikely to be offered vaccines they need.

The review of immunization status can be done by a nurse or other designated individual, a logical time being during an admission interview or a new patient health history. Once patients lacking vaccinations are identified, the appropriate immunizations can be administered. The use of standing orders greatly facilitates this process and has been shown to be an effective means of increasing immunization rates.[6] The Health Care Financing Administration has approved the use of standing orders to administer vaccines to Medicare patients.[7]

Several studies show that previous hospitalization is a risk factor for subsequent pneumonia or other serious pneumococcal infection, and influenza.[8-11] However, a recent study found that we miss the opportunity to provide pneumococcal and influenzal immunization in 80% and 65%, respectively, of hospitalized patients.[5] Since none of the hospitals I contacted routinely asks adult patients about immunizations, it is likely they, too, miss opportunities to vaccinate older adults (and thus to prevent influenzal and pneumococcal disease). The Advisory Committee on Immunization Practices (AICP) recommends giving pneumococcal vaccine at any time of year, and influenzal vaccine to adult inpatients age 65 and older hospitalized between September and March (and to younger patients with high-risk conditions prior to discharge from the hospital).[7,12] In order to accomplish this, the AICP encourages the use of organizational strategies such as standing orders.

It is important to have a standard place to record vaccination status and document immunizations provided, so that this information can be located easily by providers. When an immunization is recorded only in the encounter form for a visit (as at most of the practices and facilities I interviewed), subsequent providers must work hard to determine vaccine eligibility. This creates a barrier to immunization. Documentation on the front of the chart or in a specific chart section for immunization or preventive services can facilitate appropriate vaccination.

One way to help patients keep track of their immunization status is to provide them with written documentation of vaccines received. This is rarely done for adults but is routine in pediatric practice. Lack of patient knowledge is often a barrier when physicians see new patients, something especially important now since patients change providers so often.

Very few organizations give written recommendations about influenzal immunization to employees, but it is encouraging that most do provide free, on-site flu shots to their employees. Vaccinating health care workers in long-term care facilities reduces patient mortality from influenza and lower respiratory infections more than vaccinating patients themselves.[13] The CDC recommends immunizing all groups, including employees of chronic care facilities, that can transmit influenza to persons at high risk.[12]

Although the numbers in each subgroup are small, my data indicate target areas that should be addressed in a North Carolina immunization plan. Many older adults reside in community living or rest home facilities, but the rest homes I contacted do not address the immunization needs of their residents and employees. In order to avoid missed opportunities for vaccination, we should include rest homes, home health agencies, dialysis centers, and shelters in any intervention. We should emphasize the need to assess vaccination status of residents and provide immunizations to both residents and employees.

Less than one-third of the practices and facilities I contacted had collaborated with their local health departments on projects for older adults, but the potential is there for future collaboration. Both across the nation and in North Carolina, building ties between the private and public sector of health care is essential to successful health promotion campaigns. Health departments have a long-standing interest in immunizations, but most adult immunization has been provided by private practitioners and organizations. Collaboration means sharing the experience of health departments with successful private sector practices to assure their common goal of improving the health of older adults in North Carolina.

In summary, my study highlights some of the strengths and deficiencies of current practice concerning immunization of older adults. These data can help direct future projects and policies in our state. In addition, the information can help practitioners caring for older adults and institutions providing services to this population. It is important that we have a systematic approach that includes: 1) routinely asking adult patients about immunization status; 2) offering immunizations to patients, residents, and employees; and 3) recording information about immunization in an easy-to-find location in the chart. The success of programs to improve the immunization rates of older adults depends on collaboration between public and private sectors, and it is clear that there is great potential for such collaboration in North Carolina. ❑

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Who Comes to a Skin Cancer Screening—and Why?

Amy J. McMichael, MD, and Sharon Jackson, PhD

For years, dermatologists in private and academic practice across the United States have devoted considerable time and effort to provide free skin cancer screening in their communities.[1,2] Proponents of such screening suggest that the process allows diagnosis of malignant and premalignant skin lesions in patients who would not otherwise see a dermatologist. They also claim that improved awareness of skin cancer is an important outcome of such screenings. Despite these positive attributes, questions have been raised regarding the true yield of skin cancer diagnoses and effect of skin cancer screening programs.[3,4]

We can evaluate the worth of skin cancer screenings, in part, by assessing whether participants are at increased risk and whether the yield of cancers is high enough to warrant screening. The descriptive characteristics of patients who come for screening can help define risk and awareness of skin cancers, and help determine screening success, but few studies have looked at these characteristics. Many authors claim that those who come to screening clinics are not the ones most at risk for skin cancer,[5,6] so we decided to study the demographic characteristics, how the attendees learned about the screening, and skin cancer awareness of the patients attending a 1995 free skin cancer screening clinic at our institution.

Methods

Each year, dermatologists at Wake Forest University School of Medicine sponsor a free skin cancer screening clinic during May, the American Academy of Dermatology's melanoma awareness month. The screening takes place during a 4-hour period one evening. Both faculty and community dermatologists participate in the screening, and each patient is examined by a board-certified dermatologist. Full skin examination is offered, but patients may choose a limited or partial examination. Any lesions suspicious for malignancy are documented on the intake form. The patient and the examining physician sign the form, and patients with suspicious lesions are referred to a local dermatologist for follow-up examination and treatment.

Wake Forest University's Office of Marketing and Public Relations organized advertising for the screening. Ads were placed in newspapers and announcements were made on television and radio news shows. Participating physicians made appearances on radio and television. Flyers were placed in the medical center and in the Dermatology waiting room.

In 1995, we used a self-administered survey to obtain information on skin cancer awareness and detailed demographic information about the participants. The 21-item questionnaire was designed to complement information collected on a routine intake form. The questionnaire was given to the first 110 (of 240) patients at the time of check-in as a pilot study to determine how many patients would actually participate in such a survey. Patients filled out both the questionnaire and the intake form together, and both were collected just before patients entered the examination room. Filling out the survey questionnaire was optional, but the intake form was required.

The data collected pertained to 6 major areas: general demographic information, determinants of socioeconomic status, awareness of various modes of advertisement for screening, personal history of skin cancer, knowledge base regarding skin cancer, and opinions about skin cancer.

This protocol was approved by the Wake Forest University School of Medicine Institutional Review Board.

Results

Of 110 surveys distributed, 100 were completed. There were 65 women and 35 men, (Table 1) ranging in age from 4 to 81 years

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(mean age 50.6±18.2). Years of formal schooling ranged from 0 to 22, with a mean of 12±6 years; 27% had 16 years of education, 10% had 14 years, and 15% had at least 12 years. Fifty-six percent of respondents were born in North Carolina, but 19 other states were listed as the state of birth. Most of the participants (51%) lived in Forsyth County (where Baptist Medical Center/Wake Forest University School of Medicine is located), but 39% resided in other nearby NC counties (for 10%, no county of residence was recorded). Seventy-two percent of participants were married, 11.2% had never been married, 8.2% were widowed, 6.1% were divorced, and marital status was unknown in 4%. Participants were relatively affluent, with a median income of over $30,000 per year. Ninety-seven of 99 patients (98%) had some kind of insurance coverage; 75% had only one type of insurance, 19% had 2 types, and 1 patient had 3 types.

Table 1. Characteristics of 100 study participants

Gender	
Men	65%
Women	35%
Mean age	50.6±18.2 years
Education	
<12 years	48%
>12 years	52%
State of birth	
North Carolina	56%
Other states	44%
Reported yearly income	
Less than $15, 000	8%
$15,000 - 30,000	27%
$31,000 - 45,000	16%
$More than 45,000	30%
Unknown	19%
Health insurance*	
Commercial	44%
Medicare	24%
HMO	20%
Medicaid	2%
Other	26%
None	2%

* Percentages total more than 100% because some patients had more than one type of insurance.

Patients were asked whether they had heard about the screening through radio, television, doctor's recommendation, flyer, newspaper, a friend, or other source. Most patients (83%) heard about the screening in only 1 way, but 14% heard via 2 ways, and 1 person reported hearing about the screening via 3 different ways. The most common way patients learned about the screening was through newspaper advertisement (35% of patients), television announcements (27%), or from a friend (17%). There was no consistent pattern among those who heard in 2 or 3 ways, but it is interesting that 3 participants learned about the screening via electronic mail.

Patients were allowed to check as many reasons as applicable for coming to the screening. Most (47%) cited only 1 reason for coming to the screening, but 38% came for 2 or 3 reasons. Ten percent of patients cited no reason for coming to the screening and 5% had more than 3 reasons for coming for evaluation. The most common reason cited was to obtain peace of mind (49%). The fact that the screening was free, that patients felt it was "time for my skin to be checked," or that they were worried about cancer in general were noted in 44%, 35%, and 32% of cases, respectively. Only 2% came to the screening because they were referred by a physician. The most common dual reason for coming (in 37% of cases) was because the screening was free and the participant felt it was time for a skin exam; 21% came because it was free and for peace of mind. Of the 19 patients who came for 3 reasons, 42% said it was because it was free, they were worried about skin cancer, and it was time for a skin exam.

A number of questions probed patients' attitudes about their general and dermatological health. Most (80%) rated their health (relative to other people their age) as average or above average. Fourteen patients (15%) rated their health as excellent, and only 5% rated their health as below average or poor. Five patients did not rate their health. Seventeen patients reported a skin examination by a physician prior to the screening. Average time between the previous examination and the screening was 1.7±2.8 years.

Table 2. Barriers to obtaining skin examination and care

Potential barriers	Agree	Disagree	No answer
I've been healthy, so I don't need a skin exam	6%	86%	8%
If I had cancer, I'd rather not know	5%	87%	8%
It's hard for me to get to the doctor	13%	79%	8%
I don't need an exam unless I have skin problem	14%	76%	10%
Skin cancer can always be cured if caught early	43%	44%	13%
You can have skin cancer and have no symptoms	81%	8%	11%

Twenty-eight patients reported a previous skin examination by a dermatologist at an average of 2.1±2.6 years ago. Fourteen patients (7 men, 7 women) reported having a total of 15 skin cancers in the past (6 basal cell carcinomas, 6 squamous cell carcinomas, 3 melanomas, 4 skin cancers of unknown type).

> "Most participants said they came for screening because they wanted to obtain peace of mind about skin cancer, but the fact that the screening was free ran a close second."

We asked about patients' knowledge of skin cancer. Most participants (48%) thought they had about the average person's chance of developing skin cancer, but 24% thought they were more likely than the average person to develop skin cancer. Even among the 14 patients who had had skin cancer, only 7 thought their chances of getting another skin cancer were higher than average, and one actually thought his chances were less than average. Seventy-nine percent of patients knew that melanoma was a more serious form of skin cancer than basal and squamous cell cancer (18 patients did not answer the question or were not sure). Ten patients thought that women were more likely than men to develop skin cancers, and 8 thought men were more susceptible. Seventy-five patients (77%) thought there was no difference in risk between men and women. Forty-four percent correctly thought that persons whose parents had a history of skin cancer were more likely to develop it than someone whose parents had no such history. Fifty-three percent incorrectly answered that there is no difference.

Fifty-five percent of the participants thought a skin exam should be performed every year on persons over age 40, but 19% thought every 3 years would suffice, and another 8% thought that every 5 years or more was sufficient. Few of our participants' perceived significant barriers to skin examination and care (Table 2, preceding page).

Discussion

Media coverage and publicity effectively attracted patients to our skin cancer screening clinic. Most participants heard about the clinic through newspaper and television announcements, echoing the importance described by others[1] of involving the media in getting the word about screenings.

More women than men answered our survey, but in proportions that closely matched those of attendees at the screening. (It is well known that more women than men attend health awareness screenings.[7,8]) Nevertheless, men have a higher incidence and mortality rate for skin cancer than women,[9] so perhaps we should gear advertising to those who are most at risk. This could be accomplished by directing ads toward men in radio, television, and newspapers.

Educational level of our population was also quite high (52% had more than a 12th-grade education). This may speak to population reached by the modes of advertisement used or to a healthy participant bias leading those who are more aware of health risks (perhaps because of more formal education) to seek out skin examinations. We have no data to suggest that those who are more educated are at higher risk for skin cancer. Almost all patients screened, like almost all participants in our study, had some form of heath insurance. This may reflect the socioeconomic level of those attending the screening. In the future, we may need to target those who have less formal education and the uninsured.

Most participants said they came for screening because they wanted to obtain peace of mind about skin cancer, but the fact that the screening was free ran a close second. Interestingly, physician referral played a very small role in recruiting patients. Nondermatologist physicians could help in this regard by encouraging patients to participate in skin cancer screenings as an adjunct to usual health care, especially if they do not regularly see a dermatologist. Few survey participants noted any significant barriers to obtaining a skin examination, but this may reflect the fact that we studied the motivated individuals who came to the screening, and they had few barriers to report.

Our participants demonstrated significant defects in knowledge about skin cancer. Even those who already had a skin cancer did not realize that this put them at higher risk of another skin cancer. Most people knew that melanoma is the most serious form of skin cancer, suggesting at least a foundation of awareness about different forms of skin cancer. However, most participants had very little knowledge of particular facts about skin cancer or who it affects most commonly.

> "...we can aim to improve patient education through more media support of skin cancer awareness efforts and by soliciting the help of nondermatologist physicians."

Although our study was not designed to measure and assess yield of skin cancers at skin cancer screenings, a study of this nature would be the logical next step. Because screenings pull from a large population, follow-up for identified skin cancers is often spread among many physicians in the area. A concerted effort to call patients thought to have skin cancer to assess follow-up would be necessary.

It certainly can be argued that skin cancer screenings do not always reach those most at risk, and that they are not the best way to diagnose a large proportion of skin cancers. But they give peace of mind to participants and they may well increase knowledge about skin cancer as participants read the written information provided at the screening and discuss the disease with screening dermatologists. We did identify participants who were at increased risk of skin cancer because of past history of skin cancers. Only one-half of these patients realized that having one skin cancer increased their risk of developing further skin cancers in the future. This result shows that for our small sample, some of the attendees are at increased risk for skin cancer, but lack knowledge of their risk. From a professional perspective, we can aim to improve patient education through more media support of skin cancer awareness efforts and by soliciting the help of nondermatologist physicians. ❑

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North Carolina Firefighter Deaths

A Progress Report and Safety Inquiry

Scott L. Bullard, MS IV

Nearly 100 firefighters die and another 100,000 are injured each year in the United States.[1] This means one firefighter dies every 3 or 4 days, and approximately 8000 are injured per month.[1] The good news is that the nationwide trend in firefighter deaths is down (92 US firefighters died in 1996, down 3.2% from 95 in 1995 [2]). North Carolina mirrors the nation in averaging 2.5 deaths per year during the past 25 years, but there is optimism because the death rate has been lower over the past 7 years.

In this article I update a report from a decade ago by Fort and Griggs,[3] and point out a shift in mortality of North Carolina firefighters from cardiac events to accidental causes. I also provide data on whether fire departments across the state that serve populations greater than 5000 adhere to safety recommendations of the National Institute of Occupational Safety and Health (NIOSH).

Firefighter Mortality in North Carolina

Nineteen North Carolina firefighters died during the 11 years from 1986-1996, a rate that is only 56% of that reported by Fort and Griggs during 1972-1985 (43 deaths in 14 years).[3,4] Deaths attributed to accidents declined 22% from 20 during 1972-1985 (1.43/year) to 12 (1.09/year), but deaths from cardiovascular disease fell 61% from 23 in 1972-1985 (1.64/year) to 7 (0.64/year). The mortality profile of the past 11 years[3,4] (Figure 1, next page) shows that the number of accidental deaths (12) exceeds cardiovascular deaths (7); in contrast, during the prior 11-year period (1975-1985) cardiovascular and accidental deaths were both higher and equal to one another (17 each). Over the past 25 years there were 29 deaths (47%) from cardiovascular causes and 33 deaths (53%) from accidents. This transition from cardiovascular to accidental deaths parallels what has happened in the US: Accidents claim the majority of men's lives before age 35 and heart diseases lead after age 35,[5] but firefighters are at special risk and their exposure to extreme stress, exertion, and hazards make generalizations with the public difficult.

It is appropriate to reiterate that cardiac wellness is essential for fire personnel because of the nature of their work.[6,7] The risk factors suggested by Fort and Griggs: high blood cholesterol, high blood pressure, cigarette smoking, and physical inactivity, are as important today as they were 10 years ago since the incidence and prevalence of atherosclerosis remains high and treatment remains imperfect.

Perhaps the ongoing health maintenance programs initiated by many fire departments are paying dividends (note the decreasing mortality reflected in Figure 1).

Especially impressive is the recent cardiovascular death toll compared to 25 years ago. Preventive strategies that go beyond mere physical fitness programs in fire stations to include high-fiber, low-fat, low-cholesterol diets, smoking cessation programs, and periodic health screening have likely contributed to the improvements noted during the past 25 years. In addition, the fire service today is generally younger and better educated than in the past, which would favor accidental causes of death over chronic disease.

Firefighter Safety Survey

No report on firefighter mortality in North Carolina would be complete without a focus on deaths attributed to accidents. Fort and Griggs suggested highlighting the basic safety principles that should be observed at each incident, and in 1994 NIOSH published *Alert: Request for Assistance in Preventing Deaths and Injuries in Firefighters* following its investigation of several tragic firefighter deaths. I used the NIOSH report as my model for inquiry into the safety practices of North Carolina fire departments.[8]

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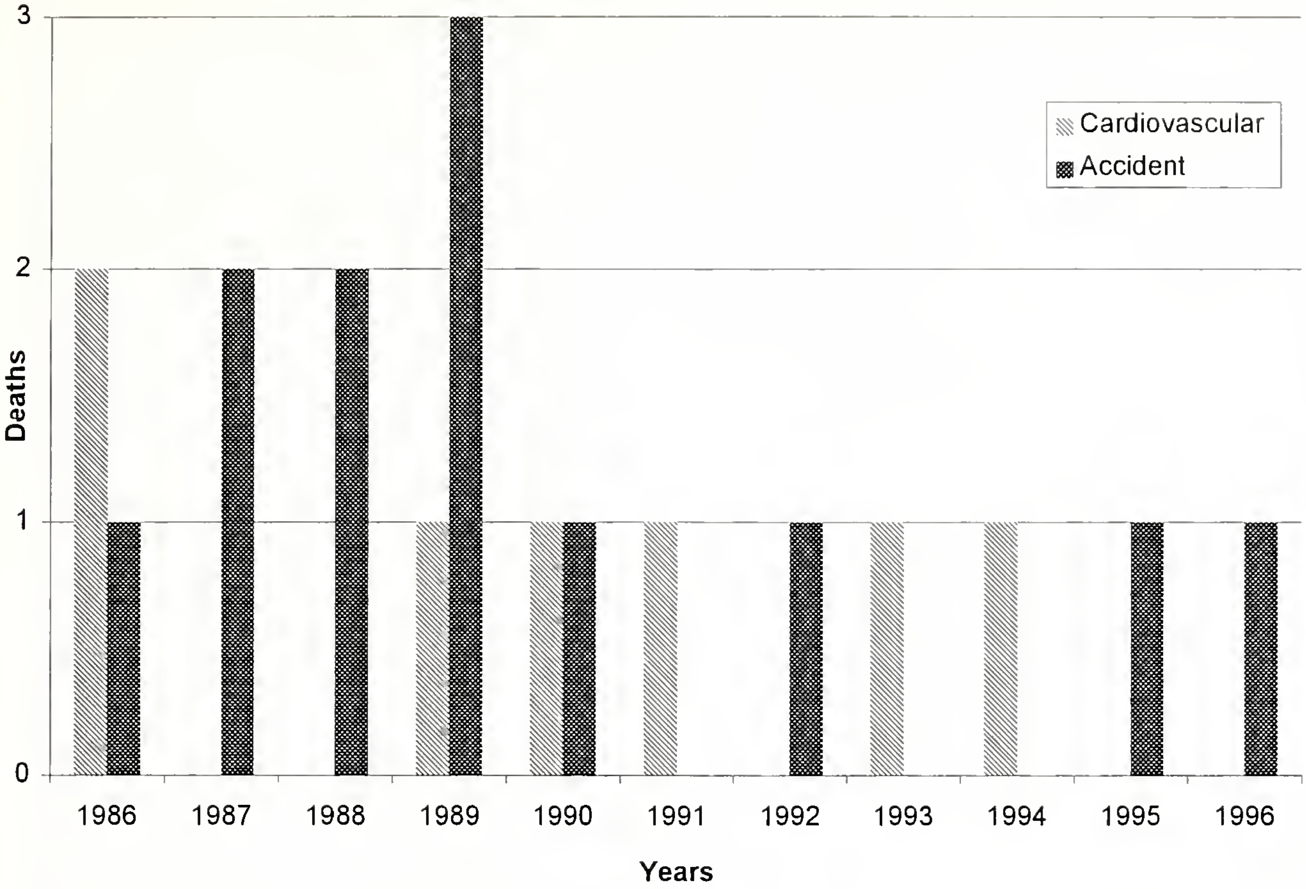

Fig 1: Line-of-duty deaths of North Carolina firefighters, 1986-1996

Table 1. Safety characteristics of North Carolina fire departments

	Population served by fire department (in thousands)					
Questionnaire results	**<10**	**<20**	**<50**	**<100**	**>100**	**Totals**
Fire department safety officer						
part-time	16 (46%)	13 (52%)	6 (67%)	11 (69%)	2 (40%)	48 (53%)
full-time	10 (28%)	3 (12%)	1 (11%)	2 (12%)	1 (20%)	17 (19%)
none	9 (26%)	9 (36%)	2 (22%)	3 (19%)	2 (40%)	25 (28%)
Incident command system						
yes	31 (89%)	24 (96%)	7 (78%)	15 (94%)	5 (100%)	82 (91%)
no	4 (11%)	1 (4%)	2 (22%)	1 (6%)		8 (9%)
SCBA*						
yes	31 (89%)	24 (96%)	9 (100%)	14 (88%)	5 (100%)	83 (92%)
no	4 (11%)	1 (4%)		2 (12%)		7 (8%)
Firefighter accountability system						
firefighter	25 (71%)	15 (60%)	6 (67%)	12 (75%)	3 (60%)	61 (68%)
unit	2 (6%)					2 (2%)
none	8 (23%)	10 (40%)	3 (33%)	4 (25%)	2 (40%)	27 (30%)
Personal alert safety system devices						
SCBA*	28 (80%)	18 (72%)	8 (89%)	12 (75%)	5 (100%)	71 (79%)
firefighter	6 (17%)	5 (20%)	1 (11%)	4 (25%)		16 (18%)
none	1 (3%)	2 (8%)				3 (3%)

*SCBA: Self-contained breathing apparatus maintenance program

Material and Methods

I telephoned fire departments in NC cities with populations greater than 5000 to survey the implementation of safety policies advocated by NIOSH to minimize risks of injury and death at the scene of a fire. My standardized questionnaire consisted of: 4 safety policy recommendation questions from NIOSH and 1 about use of a safety officer item, explanations, a statement of purpose, and answers for the respondents. The preferred respondent was a safety officer or someone in an equivalent position, but fire chiefs, staff and line officers, engineers, and firefighters were represented as availability and circumstances dictated. Since the questions applied to all fire department personnel with an emergency response role, the rank of the respondent had little impact on the submitted responses.

After each interview was completed, data were entered into a database and aggregated to ensure confidentiality. The data were compared according to percentage compliance with the 5 safety recommendations; the data were categorized by municipality population size and fire department size based on the population served.

Results

Ninety out of 102 departments (88%) responded during a 3-day calling period in July 1996. Response rates varied from 78% of 45 departments serving populations less than 10,000, and 93% of the 27 departments serving populations serving 10,000-20,000, to 100% of the 30 departments serving populations greater than 20,000. These civilian and military agency departments serve 59 of the state's 100 counties.

Fire department safety officers. Seventeen (19%) of the 90 fire departments had full-time and 48 (53%) had part-time safety officers (individuals whose primary function was emergency incident safety and management of the fire department health and safety program). I asked about the safety officer position to gain insight into how departments were using the designation and how the role and responsibilities conformed to the consensus standards of the National Fire Protection Agency (NFPA).[9,10] My data suggest that most (72%) North Carolina departments have safety officers, who administer and manage safety programs.

NIOSH recommendations. NIOSH recommends that fire departments: 1) use a written management and incident command system; 2) use a written respirator maintenance program for self-contained breathing apparatus; 3) use a personnel accountability system for tracking fire company members; and 4) use personal alert safety system devices.[8] In general, compliance with these recommendations was high (Table 1). I asked if fire department accountability systems tracked individual crew members or only company units, and in departments where personal alert safety system devices were worn, whether the device was located on the self-contained breathing apparatus or on the firefighter's protective clothing. Responses to these questions (Table 1) help clarify how individual departments meet various recommendations in their respective jurisdictions and reveal subtle and idiosyncratic differences in operating styles.

Table 2, below, depicts aggregated responses to questions about the NIOSH recommendations. The most dramatic aspect of these data is the fact that only 66% of the departments surveyed met the minimum safety baseline for all recommendations. Most interestingly, the highest percentage compliance with all NIOSH guidelines (71%) was found in small departments serving less than 10,000 citizens and operating with the least resources.

Discussion

Most North Carolina fire departments (66%) adhered fairly highly to safety guidelines, but the consistent incidence of death

Table 2. Adherence with recommended firefighting safety measures

Compliance with NIOSH* guidelines	Population served by fire department (in thousands) <10	<20	<50	<100	>100	Totals
4 of 4	25 (71%)	15 (60%)	10 (63%)	6 (67%)	3 (60%)	59 (66%)
3 of 4	6 (17%)	8 (32%)	4 (25%)	1 (11%)	2 (40%)	21 (23%)
2 of 4	2 (6%)	1 (4%)	2 (12%)	2 (22%)		7 (8%)
1 of 4	1 (3%)	1 (4%)				2 (2%)
None	1 (3%)					1 (1%)
Totals	n=35	n=25	n=16	n=9	n=5	n=90

*National Institute of Occupational Safety and Health from accidents raises significant issues for further study. Declining local and national trends in mortality are promising, but general health factors likely have modified mortality levels without changing the inherent danger of firefighting.

The challenge of reducing injury and death has increased because the role of the fire service has expanded beyond fire suppression to include delivery of emergency medical services, rescue services, and hazardous materials responses.[8] These services result in more responses to alarms than in the past, further increasing risks to personnel. Moreover, the aging of fire apparatus may be a factor in many fatal accidents, especially with increased use of such heavy equipment and its adaptation to multiple functions.

> "...the immediate problem confronting those concerned with NC firefighter safety is the need to raise the 31 fire departments documented in this study (and doubtless many others across the state) up to the minimum level of safety outlined by NIOSH."

"Progress" may actually contribute to some deaths since modern protective equipment allows firefighters to operate deeper in hostile environments. This means fire personnel are facing new exposures and risks by being able to work in situations that would have been prohibited in the past.

My study probably represents a best-case scenario of fire department safety behavior in North Carolina because of the potential self-reporting bias. It is also important to remember that nearly 1300 North Carolina fire departments are not represented here (although it is reasonable to expect that many municipal and rural career, volunteer, and combination departments throughout the state meet some or all of the recommendations for preventing death and injuries in firefighters). Finally, I did not examine safety practices qualitatively, so my results reflect only a quantitative illustration of safety practices and cannot distinguish degrees of compliance or effectiveness.

Conclusion

There is no question that safety measures can prevent the death or injury of firefighters, but the application of such measures depends on a complex set of factors including fiscal conditions in fire departments that are beyond the scope of this study. However, in pricing safety investments, policy makers must consider the hazards firefighters face, and the fact that even one line-of-duty death is unacceptable if it could have been prevented by following known risk management methods.

A comprehensive safety program, the use of the best personal protective equipment, and the presence of a safety officer (or similar oversight officer) are crucial components of the most effective injury control programs, but they come with a price that often suffers in the municipal budget process. Moreover, such measures are only a part of a comprehensive firefighter health protection program, which should also include routine physical examinations and health screenings by physicians, preferably ones with fire service knowledge and experience.

At the moment, the immediate problem confronting those concerned with North Carolina firefighter safety is the need to raise the 31 fire departments documented in this study (and doubtless many others across the state) up to the minimum level of safety outlined by NIOSH. After that we will need further research to explore the dynamics of the accidents that are the leading cause of death even in the face of safety adherence. ❑

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An Assessment of the Health Habits of Physicians

What's Good for Doctors is Good for Their Patients

Kristi Sharpe Kelley, MEd, and Terri M. Manning, EdD

Most deaths in the United States can be attributed to unhealthy personal behaviors such as cigarette smoking, failure to use automobile seat belts, overconsumption of alcohol, and unsafe sexual practices.[1] The 1979 Surgeon General's *Report on Health Promotion and Disease Prevention* identified cigarette smoking, insufficient physical exercise, obesity, improper diet, stress, and alcohol and drug abuse as the major risk factors for death and disability in the US.[2] The Surgeon General's *Report on Physical Activity and Health*[3] concluded that regular physical activity greatly reduces the risk of dying from coronary artery disease, the leading cause of death in this country. Physical activity also reduces the risk of developing diabetes, high blood pressure, and colon cancer; reduces feelings of depression and anxiety; helps control weight; and helps build and maintain healthy muscles, bones, and joints. Physical activity, combined with a healthy diet, contributes to a healthy lifestyle.

Physicians are seen by the public as the single best, most reliable, and credible source of health information.[4] Physicians are in a unique position to influence their patients' health habits. Because approximately 80% of the American population visits a physician at least once a year,[5] it seems reasonable that primary care physicians serve as a primary source of health information.[6,7] And because physicians are in a position to serve as role models of health, we decided to assess the personal health habits of physicians themselves.

Table. Classification of physicians' health behaviors

Classification	Point total	Total number in group	% of total
Unhealthy	< 8	1	1
Poor	9-13	16	18
Average	14-18	53	60
Very good	19-23	18	20
Excellent	24	1	1

Methods and Results

We mailed the Physician's Health Behavior Questionnaire to 539 physician-members of the Mecklenburg County Medical Society, which includes Charlotte; 92 of the 539 responded. We used 20 questions to assess eight health habits: exercise, diet, safety, stress, cholesterol, blood pressure, and alcohol and cigarette use. Respondents were classified on the basis of positive responses to the 20 questions: a score of 24 was considered excellent; 19-23, very good; 14-18, average; 9-13, poor; and below 9, unhealthy.

We found that male respondents tended to be older, taller, heavier, and have a higher body mass index (BMI) than female respondents. Most physicians accumulated average health habit scores (see Table, above), but almost one-fifth had very good or excellent scores. Nearly all physicians were nonsmokers, said they consumed little or no alcohol, and reported "good" (less than 200 mg/dL) cholesterol levels, and normal blood pressure. Most physicians said they engaged in aerobic exercise three or more days a week.

A large minority (42%) of physicians reported their stress levels as at least "moderate distress." According to our respondents, most did not eat the recommended amounts of foods listed in the new Food Guide Pyramid;[8] most ate fewer than the recommended number of servings of complex carbohydrates or

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fruits and vegetables each day and most ate more than the recommended number of servings of fried foods per week.

We assessed universal office safety by asking physicians how often they wore latex gloves, changed the paper on the examination table between patients, etc. Only about one-half (51%) said that they observed such precautions *every* time. This is a disturbing finding, given that nosocomial infections are frequently due to the failure of health care workers to wash their hands.

Recommendations

Based on the results of our survey, we recommend:

- ✔ Medical students and young physicians should be taught how to live a healthy lifestyle so that they can use this information and pass it on to their patients.
- ✔ There should be (perhaps the Medical Society should offer) corporate wellness programs that would offer to all physicians, residents, and staff personnel the benefits of exercise and a stress management program.
- ✔ Physicians should strive to achieve for themselves the significant health benefits of moderate amounts of physical activity (30 minutes of brisk walking, gardening, dancing, cycling, or swimming on most, if not all, days of the week). Physicians should recommend this goal of moderate physical activity to their patients.
- ✔ A number of studies have documented that employees who are healthy and fit have lower health care costs. Physicians should adopt a healthy lifestyle so that they can serve as role models to their patients, and simultaneously reduce their own health care costs.
- ✔ Finally, physicians should observe universal safety precautions in their practices 100% of the time. This is essential if they are going to serve as truly responsible professionals for their colleagues, for themselves, and most importantly, for their patients. ❑

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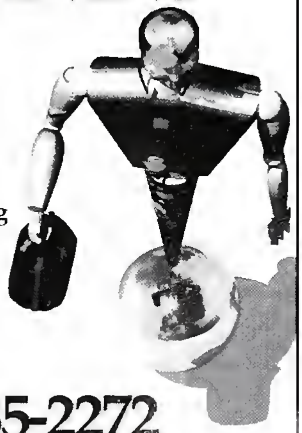

Carolina Physician's Bookshelf

Accidental Falls: Their Causes and Their Injuries

by Alvin S. Hyde, PhD, MD,

Key Biscayne: Hyde Associates, Inc., 1996

Reviewed by Sharon F. Halperin, PT, MPH,
Columbia Home Care, Chapel Hill

I recently had the pleasure of reading *Accidental Falls: Their Causes and Their Injuries* by Dr. Alvin S. Hyde. I needed a good resource to prepare for an educational in-service to my home health agency staff which consists of nurses, physical therapists, and home health aides. This book was a godsend.

Accidental Falls is written clearly and concisely. Dr. Hyde highlights important passages and uses excellent graphics to illustrate his points. I found it most helpful to be presented with a summary and bibliography at the conclusion of each chapter and particularly enjoyed learning the various biomedical vs environmental factors leading to falls.

Hyde outlines startling facts and figures at the onset (i.e., accidental falls are among the leading causes of injury reported to emergency rooms), setting the stage for the important information that follows.

An important chapter is chapter 10, which discusses fall prevention. This information is useful to me as a physical therapist, but it is also applicable to a host of other professionals not directly connected to health care—architects and planners for example—who are instrumental in designing our environment to help us avoid accidental falls.

Most health care practitioners know that the reasons one might fall change as one ages. However, one of the leading indicators of fall predictability is the relative amount of time a person is sedentary. This, of course, worsens with age. Dr. Hyde is right on target when he discusses the importance of large-scale national studies directed at reducing falls. These studies look at improving mobility, strength, and balance and ways to optimize health behaviors and environmental conditions.

Feedback on our fall prevention in-service was positive. Thank you, Dr. Hyde, for an excellent and timely publication. ❑

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New Books, Briefly Noted

Reviewed by Ed Halperin, MD, Journal Deputy Editor, Professor and Chair, Duke Department of Radiation Oncology, Professor, Department of Pediatrics, Duke University

Brodie K, Banner L
Keeping an Open Door: Passages in a University Presidency
Durham: Duke University Press, 1996

It has been our custom, in this section of the *Journal*, to review, whenever possible, books written by North Carolina physicians. Under this directive I went to a local bookstore and picked up a copy of *Keeping an Open Door* by Dr. Keith Brodie. Dr. Brodie has been James B. Duke Professor of Psychiatry, chair of Duke's Department of Psychiatry, chancellor of the University, and, from 1985 to 1993, president of the University—certainly a distinguished North Carolina physician.

Keeping an Open Door is a collection of essays on the role of the University in society and the nature of the modern university presidency. Brodie has also included selected speeches and introduces them with memoirs of his presidency.

The memoirs are largely devoted to managing the university at large and touch only lightly on the difficulties of managing the academic medical center. I had hoped for more details about how listening skills acquired in psychiatric practice might apply to managing the University. Most of the book is devoted to issues that consume the time of a modern university president: athletics, fundraising, construction, campus race relations, attempts to change the racial and gender composition of the faculty, and the limited tools available to a president in moving the university in the direction he or she envisions.

Particularly well-written and generous in spirit are the chapters that consider the role of the university, both nationally and internationally, the place of athletics in university life, and the need for a more civil discourse on campus.

There is, however, a rather outrageous reprise of the Holocaust denial debate at Duke. In 1991, the Duke student newspaper carried a full page advertisement run by a notorious anti-Semite denying the existence of the Holocaust. At a time when other universities elected not to run the advertisement at all, labeling it nonsensical drivel, Brodie took the opportunity to defend the right of the newspaper to run the advertisement as a "free speech" issue. Defending himself in the book, Brodie points out that "we did have our supporters in the Jewish community." He almost points out that some of his best friends are Jewish, but he restrains himself from that.

There is a growing body of literature on the nature of the university presidency. This book honorably joins that rank. Those hoping for a detailed discussion of the role of the academic medical center in the university, or the role of the physician as the university administrator, will, however, need to look elsewhere. ❑

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Freeman Jr, JS
Toward a Third Century of Excellence:
An Informal History of the J.B. Lippincott Company on the Occasion of Its 200th Anniversary
Philadelphia: J.B. Lippincott, 1992

You'd think I would have something better to do than read a corporate history. I received this book from the company that publishes my textbook (*Pediatric Radiation Oncology*) and quickly read through its 122 pages. I found the book surprisingly interesting. Before the advent of television, radio, the Internet, and, heaven help us, cellular phones, publishers were the real controllers of our country's culture. For two centuries, Lippincott has published magazines, popular fiction, and, most recently, textbooks. Mr. Freeman, in this well-written history, reviews the story of the company and the life and times of the prominent (and very rich) Philadelphians who ran it. The company is now part of an international mega-conglomerate.

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Black E, Black M
The Vital South: How Presidents Are Elected
Cambridge: Harvard University Press, 1992

Merle Black is a professor of Political Science at Emory University in Atlanta. His brother, Earl, is a professor of Political Science at the University of South Carolina. I read their earlier book, *Politics in Society in the South*, a few years ago and finally caught up their most recent contribution, *The Vital South.*

The essence of the book is that, over time, the South has gone from a solidly Democratic voting block to voting Republican on the national level—with Democrats doing better in local elections. The race card plays prominently here—both a result of changing demographics as well as the long-term implications of the Goldwater/Nixon "Southern strategy" of the 1960s. The African-American vote is strongly Democratic and the white male strongly Republican.

For the political junkies among *Journal* readers, there are fascinating tables, graphs, and elaborate maps depicting voting patterns—a treasure trove to mine over the book's 400 pages. (That is, if you can tear yourself away from C-Span's televised debates from the chambers of the House of Representatives.) ❑

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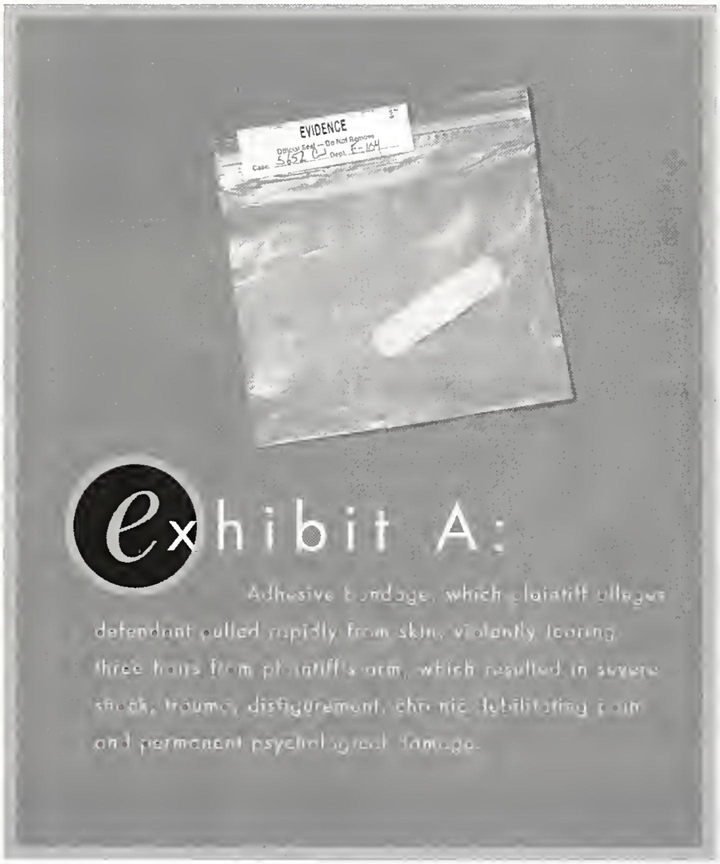

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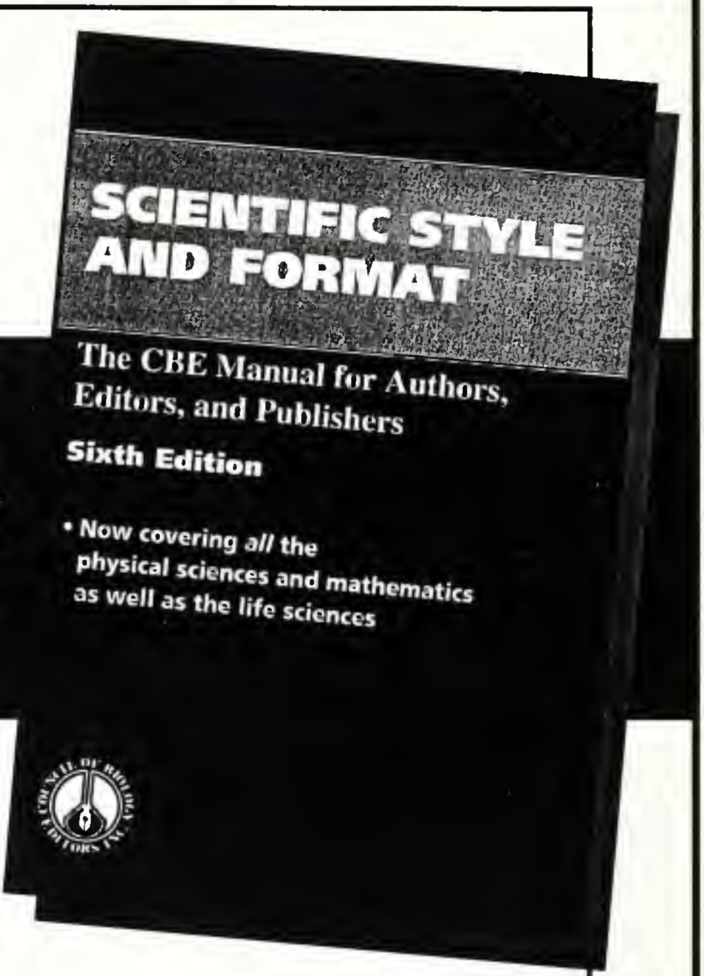
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After the Emergency Department

A Study of Pediatric Injury Follow-Up

Andrew R. Jones, MD, PhD, Michelle Brandow, RN, BSN, and Effie Smith, BS

Injury is a major cause of Emergency Department (ED) visits for children.[1] Success in managing such injuries on an outpatient basis often depends on adequate home support for convalescence, and on compliance with the plan for follow-up care.[2,3] The importance of follow-up is well established for certain injuries.[2,4] Follow-up evaluation can clarify the severity of the original injury, disclose complications in the early stages, permit reappraisal and management of related social crises at work or school, and provide a second opportunity (in a less harried setting) to identify signs of neglect or abuse that might have caused the injury in the first place.[4]

Young patients often fail to comply with recommendations for follow-up, the reported incidence of failure ranging from 15% to 72%.[5-7] Compliance rates can be improved through the use of special measures such as having a nurse make follow-up telephone calls,[8] or by providing specific follow-up appointments to patients at the time of discharge from the ED.[6] However, such special measures occupy personnel time and add complexity to discharge procedures, increasing the cost of care for all patients.

In our ED, we have actively tracked compliance with follow-up only in cases of neglect or abuse; otherwise an adult accompanying the patient is asked to arrange follow-up with a practitioner (specified at discharge), but no other measures are taken to ensure follow-up. Voluntary compliance has been very good, probably because of our efforts to winnow out cases of abuse. We undertook the present study to document compliance, and to characterize individuals likely not to comply in follow-up.

Methods

We conducted a 3-month prospective review of consecutive, injured, pediatric patients treated in the Wake Medical Center ED from August through November, 1996. This hospital includes a Level 2 trauma center and is the largest hospital in Raleigh. It is located on the edge of an urban-residential neighborhood two miles from the city center and has direct access to an interstate highway. The study was exempted by the Center's Investigational Review Board.

During the study period, 41% of all ED patients under age 18 were covered by conventional insurance, 52% had Medicaid coverage, and 7% had no insurance. Uninsured county residents were eligible for health care financial assistance through a county government program.

Quality assurance nurses screened all ED patients during this period. We included for study all patients age 1-17 who were victims of traumatic injury, were discharged from the ED as outpatients, and were given written instructions to follow-up with a physician. These instructions indicated the importance of follow-up, and offered a range of days after the ED visit during which follow-up should be obtained. Patients who had no regular physician, or whose physician was unavailable, were given the phone number and address of a private or hospital-based clinic physician (assigned by an established call rotation) willing to render follow-up care. Excluded from the study were cases of suspected abuse or neglect (who were referred to the hospital's multidisciplinary child abuse team). In these cases, special procedures guided case guardianship and follow-up tracking in keeping with standard practice.[9]

Follow-up compliance was documented by telephoning the assigned physician's office. When patients failed to follow-up at the office, the usual caregiver was interviewed to determine the cause of late or failed follow-up. Reports of follow-up visits at other medical offices were verified by calls to those offices. As a measure of missed child abuse, the cause of injury as determined at follow-up was compared to the cause recorded in the ED record.

We examined patient characteristics that might affect compliance in follow-up: age >6, gender, in-city residence, absence of the usual caregiver in the ED, site of injury, type of

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The authors are affiliated with the Departments of Orthopaedic Surgery and Quality Assurance, Wake Medical Center, Area Health Education Commission, and the University of North Carolina School of Medicine, Chapel Hill. This article was adapted from a presentation to the Orthopaedic Trauma Association, Boston, Mass., November 1996.

injury, minority race, and whether follow-up was arranged for public clinic or private office. The proportion of children in each group who exhibited these characteristics was compared using the Fisher Exact Test; p-value of <0.05 was considered significant.

Results

A total of 435 injury cases were reviewed, and 70 (16%) met entry criteria. Table 1, below, shows the type of injuries sustained by the study patients in the preschool, elementary, and adolescent age ranges. Lacerations and burns were more frequent in preschoolers, while sprains and fractures were more commonly seen in school-aged children.

Eleven of 70 cases (16%) did not comply with follow-up instructions (7 failed to obtain follow-up and 4 came much later than was recommended). The 7 who failed to follow-up included 6 for whom an appointment was made but the injury resolved entirely before follow-up the appointment occurred, and one case in which the family directed its efforts to the care of more seriously injured family members despite lingering symptoms of the injury in the child. In the 4 patients followed up later then recommended, 3 were the result of improvement to the point that full recovery without further treatment was anticipated but then didn't occur. In one case, a 4-week delay in follow-up of a severe contusion resulted from a desire to combine the visit with one scheduled for an immunization.

In all cases of failed follow-up, family members exercised appropriate caution in disregarding the instructions for follow-up. No telephone interview suggested serious deficiencies in caring for a child with significant impairment from injury. In no case was unwillingness of an assigned physician to evaluate the patient within the recommended time interval the cause of failed follow-up. The cause of injury noted in the ED record matched the cause reported by usual caregiver at follow-up in each of the 65 cases for which these data could be compared.

Noncompliant patients did differ significantly from compliant patients in several respects (Table 2). The mean age of the noncompliant patients was 11.2 (equally divided between those age 6-11 and those 12-17); none were younger than 6. Compliant patients had a mean age of 8.1, and 41% were less than age 6. The noncompliant group contained a higher proportion of in-city residents, minority races, and underinsured (45% had no insurance, and 55% used Medicaid). There was no statistical difference in the proportion of compliant and noncompliant groups in which a usual caregiver was present at the ED visit (82% vs. 65%, respectively) or in the proportion assigned to follow-up in a private practitioner's office versus the hospital's outpatient clinic (43% vs. 36%). There were no differences in sex distribution or sites of injury between the compliant and noncompliant groups.

Table 1. Types of injuries in ambulatory pediatric patients advised to have follow-up

Age	Laceration	Burn	Contusion	Sprain	Fracture	Other	Total
1-5	10	7	3	0	2	2	24
6-11	4	0	5	2	10	2	23
12-17	3	2	3	5	10	0	23

Table 2. Proportion of patients with significantly* different socioeconomic characteristics affecting compliance

Patients	Preschool age (<6)	Minority race	City resident	Health insurance	All patients
Noncompliant	0%	82%	91%	0%	16%
Compliant	41%	42%	48%	37%	84%

*p-value <0.05 by Fisher exact test

Discussion

We sought to characterize the compliance in our pediatric patient population in follow-up after ED care for accidental traumatic injuries. Compliance was generally good. Our overall compliance rate of 84% is nearly twice that of injured adults given similar instructions,[10] and 15%-44% higher than in similar studies of follow-up compliance after ED care of short-term pediatric illnesses.[5-7]

We believe that the high rate of compliance found in this study results from the activity of our facility's Child Abuse Team. This team is supported by state and local agencies with both private and government funds, and is staffed by salaried and volunteer professionals and laypersons. The team is involved whenever ED staff suspect that neglect or abuse may have caused a pediatric injury. In such cases, the child abuse team tracks case follow-up and provides guardianship when needed. Exclusion of these suspected cases of neglect and abuse probably eliminated many follow-up failures.

This study offers reassuring evidence that innocently injured children are likely to obtain follow-up as recommended. A few patients failed to follow-up as recommended because they had recovered either completely or enough so that caregivers believed recovery would occur without further treatment. As far as could be determined by the methods of the study, the decision not to obtain follow-up was deemed appropriate in all cases; in no instance did failure to follow-up appear to cause additional problems for the patient.

The few of our patients who failed to follow-up were primarily older children, minorities, city residents, or underinsured. Others have documented that minority race and lack of insurance are risk factors for follow-up failure.[6,8] Nairn and Sugarman[7] found that children with urinary tract infection were much more likely to obtain follow-up if their usual caregiver was present to receive instructions at the time of discharge from the ED. We found only a nonsignificant trend toward such correlation. Our follow-up instructions were carefully conveyed to the child's guardian in writing, for transmission to the primary caregiver if needed. This practice may explain this difference between the two studies.

Where follow-up failure is a common problem, several techniques can improve compliance. One low-cost technique is to provide the patient with a follow-up appointment time while in the ED.[10] Follow-up telephone contact can raise the rate of follow-up,[6] although this is time-consuming for staff.[8] The added cost of these special measures can be lessened by applying them in only cases at highest risk for follow-up failure, recognizing that the characteristics of those at risk may change along with the changing system of health care delivery.

In summary, we have documented a high rate of compliance with instructions for follow-up care after ED treatment of pediatric injury. There are several likely reasons for this. Part of our success may be due to our special handling of abuse or neglect cases, which were tracked actively. We used a panel of follow-up physicians who were attentive to their responsibilities to provide timely follow-up evaluations as recommended by ED personnel. Finally, we provided written instructions on how patients should arrange follow-up care. ❑

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Hypertrophic Pyloric Stenosis in Infancy

An Analysis of Treatment Outcome

Don K. Nakayama, MD, and Lesli A. Taylor, MD

Cost-containment strategies seek to decrease the length of stay (LOS) in hospital. The ethic of limiting LOS has been codified by Milliman and Robertson into a set of actuarially based guidelines that give an ideal LOS for an array of diagnoses.[1] Based on such guidelines, health maintenance organizations, insurance carriers, government agencies, and hospital utilization review departments often ask surgeons to limit the LOS based on admitting diagnosis alone. But in infants, complicating factors such as prematurity and congenital anomalies profoundly affect how well patients do after an operation.

Efforts to contain the cost of medical care are desirable as long as quality is not compromised. With this in mind, we undertook a retrospective review to identify clinical factors that determine LOS for pyloric stenosis. We wanted to learn what strategies might safely decrease LOS and in-hospital costs. This kind of analysis, commonly used for prevalent adult conditions such as aortocoronary bypass and vascular surgery, has not often been applied to pediatric surgical conditions.

Materials and Methods

We retrospectively reviewed the LOS for all infants undergoing pyloromyotomy for pyloric stenosis between 1992 and 1996 at the University of North Carolina Children's Hospital in Chapel Hill. We collected clinical and operative information including gestational age at birth, premature birth (defined as delivery after less than 36 weeks' gestation), presence of associated conditions and anomalies, preoperative complications, preexisting medical conditions, congenital anomalies, and serum bicarbonate at the time of admission. We obtained the data from patient records, departmental morbidity and mortality reports, and hospital quality assurance records. We determined whether diagnosis was made by physical examination (direct palpation of the pylorus), upper gastrointestinal (UGI) series, or ultrasound (US) examination of the upper abdomen.

Operative reports and clinical records were reviewed for any pre-, intra- or postoperative complications, particularly duodenal perforation or wound complications, such as dehiscence and infection. Prolonged postoperative ileus was defined as failure to achieve full-volume feedings and continued need for intravenous fluids for more than 3 days after operation.

We used no standardized protocol for the preoperative and operative management of pyloric stenosis. Responsible clinicians made the diagnosis based on their experience and physical examination, UGI contrast study, or US examination. The time of operation, based on the patient's condition and the operating room schedule, was set by the surgeon and anesthesiologist. A standard pyloric feeding schedule was used during the study period. Feedings were withheld for 12 hours after surgery. Electrolyte solution (Pedialyte, Mead-Johnson, Evanston, IN) was then given for two 15 mL feedings 3 hours apart, followed by two 30 mL feedings at 3-hour intervals. Thereafter, at 3-hour intervals, patients received two 30 mL half-strength formula feedings, 2 full-strength feedings, then 2 full-strength feedings of 45 mL and 60 mL each. If these were tolerated, the patient was allowed to feed *ad libitum*, and discharged.

The mean (±sem) value for preoperative, postoperative, and total LOS was calculated, and unpaired, two-tailed t-tests were used to compare groups by twos; ANOVA with repeated measures was used to compare multiple groups. Relationships between continuous values were determined by linear regression and calculation of Pearson's r. P values < 0.05 were considered significant.

Results

Between 1992 and 1996, 80 pyloromyotomies were performed in children aged 1.6 to 20 weeks (mean 6.4±0.4 weeks; median 5.6 weeks). Eight records were excluded because they were

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incomplete and 3 because they related to a repeat operation; the 69 remaining records are reviewed here.

Six infants had been born prematurely; 9 others had significant second conditions: bronchopulmonary dysplasia, transient tachypnea of the newborn, neonatal hepatitis, Group B streptococcal sepsis, jejunal atresia, transposition of great vessels, fetal alcohol syndrome, congenital diaphragmatic hernia, and chronic renal failure and colon perforation in one infant. The remaining 54 patients were term infants without other medical problems.

Table 1, below, summarizes the postnatal age and total LOS for uncomplicated preterm and term infants and babies with associated conditions. Premature infants came to operation at a significantly older postnatal age than patients in the other two groups. LOS (total, preoperative, and postoperative) was longer for patients who had an associated anomaly. When term and premature infants (excluding those with associated conditions) were compared, total and postoperative LOS was significantly longer in premature than in term infants.

Three (5.6%) of the 54 term infants suffered significant preoperative complications (one had severe dehydration with a serum bicarbonate of 38 mEq/L; one had recurrent apneas; one had aspiration pneumonia). Six (11.1%) suffered postoperative complications (prolonged postoperative ileus in three; wound dehiscence, duodenal enterotomy, and postoperative hypoventilation because of acetylcholinesterase deficiency in one each). There were no deaths. The presence of a preoperative or postoperative complication increased the corresponding preoperative or postoperative LOS, but not the total LOS (Table 2, bottom next page).

We studied whether method of diagnosis affected LOS in term infants. Palpation of an enlarged pylorus led to operation without an imaging study (UGI or US) in 10 patients (18.5%). A single imaging study (UGI in 24 patients; US in 10) established the diagnosis in 34 patients (63.0%). The 10 patients (18.5%) who had two studies each (UGI and US in 7; two UGIs in 3) had a significantly longer total LOS, because of a prolonged preoperative LOS (Table 2). Stepwise multiple regression identified having more than one imaging study as the sole determinant of a prolonged total LOS in term infants ($p < 0.001$).

The subgroups with the shortest total LOS were term infants with no complications in whom the diagnosis was made by palpation alone (3.5±0.5 days) or by a single imaging study (3.5±0.1 days). Nine of 54 (16.7%) term patients went to surgery on the day of admission, and 3 (5.6%) were discharged on the day following operation. One patient was operated on and discharged within 24 hours, for a total LOS of 1 day.

The severity of stenosis as measured by degree of metabolic alkalosis (elevation of serum bicarbonate) did not correlate with total or preoperative LOS.

Discussion

LOS after surgery for pyloric stenosis was strongly influenced by prematurity, and by the presence of associated health problems. In healthy term infants, LOS increased when more than one imaging study was needed for diagnosis. Preoperative complications increased the preoperative LOS, and postoperative complications prolonged the postoperative LOS, but neither significantly increased total LOS. The total LOS for all 69 patients in the study group averaged 9 days, but the total LOS for healthy term infants in whom the diagnosis made by palpation or by a single radiological examination was only 3.5 days, independent of without pre- or postoperative complications.

Table 1. Total, preoperative, and postoperative length of stay for 69 infants with pyloric stenosis

			Mean (±SEM) length of stay (days)		
Group	**N**	**Age (weeks)**	**Total**	**Preoperative**	**Postoperative**
All	69	6.4 ± 0.4	9.0 ± 2.3	4.4 ± 1.5	2.8 ± 1.3
Term, no associated conditions	54	5.7 ± 0.4	4.2 ± 0.3	1.3 ± 0.3	2.8 ± 1.3
Premature, no associated conditions	6	11.3 ± 2.7	7.3 ± 2.2*	1.8 ± 0.7	5.0 ± 2.2*
Any associated condition	9	7.3 ± 1.1	39.8 ± 14.7†	24.8 ± 10.0†	14.9 ± 5.5†

Preoperative length of stay = time from admission to operation; postoperative length of stay = time from operation to discharge. Associated conditions are summmarized in the text and do not include prematurity.

* $p < 0.05$ by unpaired t-test comparing term and premature groups alone

† $p < 0.05$ by ANOVA with repeated measures

LOS in patients with second medical or surgical problems related primarily to the underlying condition. Diagnosis was delayed when problems such as respiratory insufficiency and septicemia took precedence. Infants who had difficulty achieving full-volume feeding, or in whom feeding intolerance and vomiting wrongly ascribed to other conditions, particularly gastroesophageal reflux, had a prolonged preoperative LOS. These patients were in the hospital on the day of birth or shortly thereafter, but pyloric stenosis diagnosed only after a preoperative LOS of 24.8 days, the usual time of onset of the disease. Persistent feeding intolerance, or the new onset of nonbilious vomiting in an infant hospitalized for other reasons should suggest pyloric stenosis.

Prematurely born infants are diagnosed at a greater postnatal age than term infants,[2] as was seen in our study. There is no consensus as to whether this delay represents delayed development of stenosis or delayed recognition. Postconceptual age (gestational age at birth plus postnatal age) may better approximate the age at which stenosis develops. Delayed onset in premature infants the may be due to earlier birth, but delayed recognition may also play a role. Tack and colleagues[3] called attention to the nonspecific clinical features of pyloric stenosis in sick premature infants (recurrent nonbilious emesis, persistent abdominal distention, and inability to place a nasoduodenal feeding tube).

There is no simple explanation for the prolonged postoperative LOS among prematurely born infants. Our patients were at home when symptoms developed, and therefore preoperative LOS was not prolonged. Only one premature infant received two preoperative diagnostic studies. Postoperative LOS was not increased by postanesthesia apnea—which in the newborn rarely lasts longer than 12 hours[4] and was rare in our patients—nor by an increase in pre- or postoperative complications. One possible explanation is an unjustifiable reluctance to "push" premature infants to full feeding and discharge. Because of concerns about postoperative apnea and irregular spontaneous respiration, we often delay the start of feeding for one day, but once started, there should be no delay in feeding advancement.

The largest group of patients, term infants with no other associated conditions, should have and did have the shortest LOS. Early diagnosis, before dehydration and electrolyte imbalances become severe, often permits operation on the day of admission (as in 16.7% of cases in the present study). Chen and colleagues,[5] found that serum electrolyte concentrations and urine specific gravity were normal in 90% of patients with pyloric stenosis, and any abnormal fluid and electrolyte values were corrected within 12 hours of admission.

Palpation of the pylorus is the most direct method of diagnosis (used in 18.5% of our term infants), but there is increasing reliance on US.[6] Ultrasonography is widely available and nearly 100% accurate.[7] Obtaining a single diagnostic imaging test did not increase LOS compared to physical examination alone (but there are charges for the examination and its interpretation).

Performing two or more imaging studies significantly prolonged both preoperative and total LOS. Extra tests are justified when the pylorus is not palpable or the results of one test are equivocal. In two of our cases, equivocal tests became definitive when repeated because the lesion became more prominent over time, but in several cases the first test provided definitive findings, and the second only prolonged LOS and added radiological expense.

Table 2. Factors affecting total, preoperative, and postoperative length of stay in 54 term infants with pyloric stenosis

		Mean (± SEM) length of stay (days)		
Group	**N**	**Total**	**Preoperative**	**Postoperative**
All	54	4.2 ± 0.3	1.3 ± 0.3	2.8 ± 1.3
Preoperative complication				
Yes	3	5.7 ± 0.9	3.0 ± 0.6*	2.7 ± 0.9
No	51	4.1 ± 0.3	1.2 ± 0.3	2.8 ± 0.1
Postoperative complication				
Yes	6	4.7 ± 0.6	0.7 ± 0.2	4.0 ± 0.6*
No	48	4.1 ± 0.3	1.4 ± 0.3	2.7 ± 0.1
Method of diagnosis				
Palpation only	10	3.6 ± 0.4	0.7 ± 0.2	2.9 ± 0.3
One imaging study	34	3.9 ± 0.2	1.0 ± 0.1	2.9 ± 0.2
Two imaging studies	10	5.7 ± 1.2†	3.1 ± 1.2†	2.6 ± 0.3

* $p < 0.05$ by unpaired t-test

† $p < 0.05$ by ANOVA with repeated measures

All patients in our study underwent open pyloromyotomy. Laparoscopic pyloromyotomy can be successful, with operating time no different from the open procedure and a slightly shorter overall postoperative LOS (1.4 vs 1.8 days).[8] No studies have analyzed costs of laparascopic surgery for pyloric stenosis, but for appendectomy the cost of laparoscopic equipment and added anesthetic time negate benefits in LOS, rates of complications, postoperative pain, and recovery of bowel function.[9] [10] A minimal LOS and excellent outcome can be achieved with open pyloromyotomy.

Avoiding complications is desirable. In theory it should decrease LOS, but we could not demonstrate that the presence of complications increased overall LOS. Delaying operation to treat preoperative complications is best avoided by early diagnosis, before dehydration and aspiration can develop. Operative complications delay discharge, but the incidence is low. Our perforation rate (1/69, 1.4%) compares favorably with the 1.7% reported by others,[11] as does our wound dehiscence rate of 1.4% compared to 3.7% in a report by Hingston.[12]

Discharge on the day following operation is possible if the infant can maintain adequate hydration. Spitz noted that about two-thirds (64%) of patients had slight or no vomiting after operation, but that 19% had sufficient vomiting to modify the postoperative feeding regimen, and 17% had vomiting severe enough to delay the start of oral feedings and require intravenous fluids.[13] Prolonged ileus was uncommon in our patients (3 term infants; 5.6%), which may reflect early diagnosis of less severe disease and more aggressive feeding schedules. Georgeson and colleagues[14] tested an accelerated postoperative feeding schedule in which the first feeding was given 6 hours instead of 10 or more hours after operation. Increments in feedings were larger and given at shorter intervals than previously used. The goal was to achieve full-volume feedings within 12 to 18 hours. The authors noted that the aggressive regimen led to more postoperative vomiting but shorter postoperative LOS (35 vs 78 hours).

We use an accelerated postoperative feeding schedule. Feedings are started with 15 mL of a glucose-electrolyte solution given 6 hours after surgery; volume is increased to 30 and 45 mL at 2-hour intervals, until at least 12 mL per kg body weight is retained. Full-strength formula is then started at that volume and the baby is discharged. Feedings are kept at the same level if vomiting occurs, and withheld for 1 interval if 2 feedings in a row produce vomiting. The caretaker is told to give *ad libitum* feedings at home once the baby is able to tolerate two consecutive 12 mL per kg feedings at 2-hour intervals.

Use of such a regimen makes it possible (in theory) to discharge patients after a total LOS of 1 day (we were able to do it once during the period of review). Milliman and Robertson guidelines allow 2 days of hospitalization for pyloric stenosis: on day 1, the patient has surgery, a nasogastric tube is placed, and parenteral fluids and medications given; on day 2, diet is begun and advanced as tolerated.[1] Premature infants and babies with associated medical and surgical conditions have special factors that determine LOS, but the ideal goals are within reach for uncomplicated pyloromyotomy. Most of our uncomplicated term infants required only a single postoperative hospital day. Early discharge does require daily follow-up telephone calls until vomiting ceases. Discharge is postponed if it is felt that home care would not be appropriate because of the patient's condition or the home environment. ☐

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Mitral Valve Repair

Save the Valve!

Christopher L. Wixon, MD, Jonathan M. Philpott, MD, and W. Randolph Chitwood, Jr., MD

Repair of the mitral valve was first suggested by C. Walton Lillehei in 1957, and carried out until the early 1960s. The development of prosthetic valves eclipsed interest in repair for nearly 15 years until Alain Carpentier demonstrated the advantages of repair using his methods. Carpentier's report of over 500 patients demonstrated clear advantages for repair in terms of infection, the need for reoperation, and freedom from thromboembolic events.[1] Carlos Duran corroborated these advantages, but despite the success of Carpentier and Duran, American surgeons have been slow to embrace reparative techniques, preferring the technical ease of valve replacement.

The Decision to Operate

It can be difficult to determine the best time to operate on a patient with mitral insufficiency, particularly one who is asymptomatic and active. Previously, operation was deferred until the patient developed New York Heart Association (NYHA) class III heart failure symptoms or supraventricular arrhythmia. However, it is now clear that chronic left ventricular over-load, left untreated, may progress to an irreversible cardiomyopathy.[2] This means it is the responsibility of the primary care physician or cardiologist to obtain noninvasive measurements of left ventricular function and dimension in a timely fashion. Patients who show progressive valvular dysfunction or ventricular dilation should be considered for surgical correction. If there is no significant left ventricular dysfunction, the surgical decision is less clear, but repair may be considered to prevent chronic left ventricular overload and subsequent failure.

For the above reasons, corrective surgery is now being offered to patients who are younger and have greater life expectancy than previously. Unfortunately, biomechanical and mechanical valve prostheses carry inherent limitations (Table, next page). Although long-term durability of mechanical prostheses is excellent, they carry a significant risk of thromboembolic complications and infection, and they require lifelong anticoagulation. Bioprosthetic valves do not require anticoagulation, but their use is limited by their variable (and relatively short) lifespan. When technically possible, mitral valve repair offers the best long-term solution. Repaired valves have excellent durability, a low incidence of infection, and do not require anticoagulation. Given the younger age at which surgery is being advised, and the accompanying longer exposure to the potential complications of prosthetic heart valves, we have opted for aggressive, early mitral valve repair rather than replacement, whenever possible.

Several factors have stimulated the renaissance of interest in mitral valve repair. Recent improvements in myocardial protection afford greater tolerance to increased arrest times.[3] Furthermore, transesophogeal echocardiographic data have demonstrated that an intact papillary muscle-annular complex (often disrupted during valve replacement) is very important to the preservation of left ventricular function.[4] Because morbidity is reduced with mitral valve repair, we believe that valve repair should be offered to patients with significant regurgitation and even early symptoms. This decision is especially justified when the surgical team is adept in the techniques of mitral valve repair.

Anatomy/Pathophysiology

The mitral valve is a complex structure consisting of valve leaflets, chordae tendinae, annulus fibrosis, and papillary muscles arising from the left ventricular myocardium (Figure 1, next page). Because various pathological processes affect each structure differently, the surgeon must have a thorough understanding of the dynamic anatomic interrelations.

Degenerative (myxomatous) changes in the mitral valve cause the chordae to become thin and elongated, and the leaflets to become thinned from infiltration of mucopolysaccaride. These changes allow the anterior and posterior leaflets to prolapse beyond their anatomical positions during systole,

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Table. Advantages and disadvantages of mitral valve surgical procedures

	Mechanical prosthesis	Bioprosthesis	Repair
Durability	Excellent	Fair	Excellent
Infection risk	Moderate	Moderate	Low
Anticoagulation	Yes	No	No
Thromboembolism risk	Moderate-to-high	Moderate	Low
Technical difficulty	Low	Low	Moderate
Average time on bypass	60 min	60 min	60-120 min
Preserve papillary-annular complex	Occasionally	Often	Always

resulting in regurgitation (a "billowing" mitral valve). In rheumatic mitral valve disease, the annulus dilates, the chords become foreshortened, and the commissures fuse as the leaflets become fibrotic and calcified. The sum result is a fixed valve producing restrictive stenosis and regurgitation. Myocardial ischemia can affect a number of components of the mitral valve complex. It can cause ventricular dilation, producing enough elongation of the annulus that the mitral valve leaflets no longer coapt, and central regurgitation results. If the ischemia involves a papillary muscle with attached chordae tendinae, either deformation or rupture may occur, producing severe regurgitation. Finally, infection of the leaflets and annular structures in bacterial endocarditis can produce fenestrations of the valve.

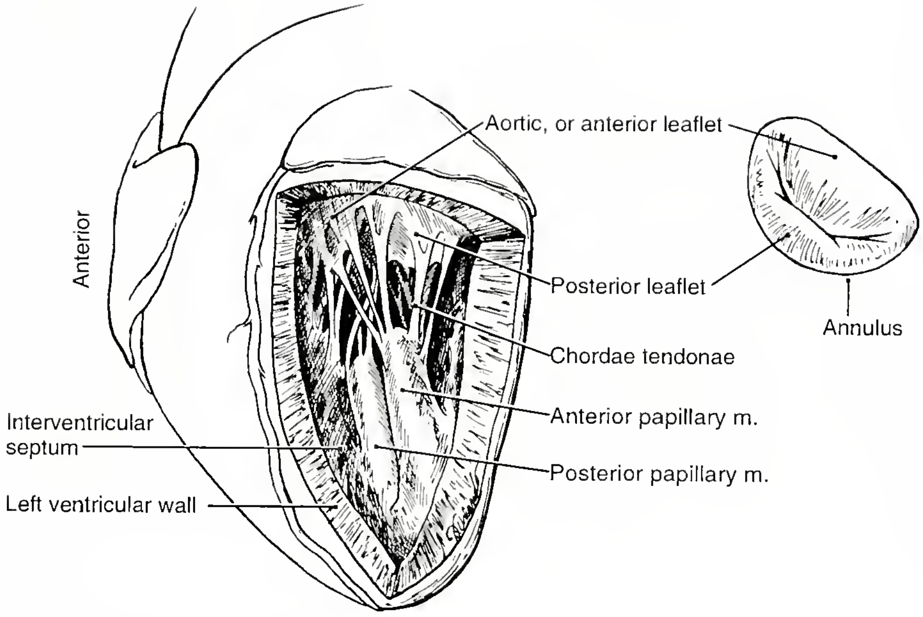

Fig 1: Anatomy of the mitral valve apparatus

Techniques of Surgical Repair

In the late 1970s, Dr. Alain Carpentier revolutionized mitral valve repair with reparative principles that are still used today. Since complex mitral valve pathology is often the result of multiple cardiac lesions, valve repair is rarely performed in isolation. Refer to Figure 2 (next page) for illustration of some of the following repair techniques.

Annuloplasty. Dilation of the annulus is a major factor in mitral insufficiency. We use a flexible ring (Baxter - Physio Ring) to restore normal geometry to the annulus and allow proper leaflet coaptation. Prosthetic ring implantation requires 20-30 minutes of operative time, and is usually simple when done in isolation.

Leaflet resection. Chordal rupture or localized fibrosis may require resection of abnormal segments of leaflets. Quadrangular resection of a mural leaflet, and sliding one or both of the other scallops avoids excess tension on the free edge when the leaflet defect is closed. This is safe, simple, and often easy to perform, taking 15-20 minutes.

Leaflet or annulus repair. In patients with endocarditis, portions of the leaflets or annulus may be reconstructed with autologous, glutaraldehyde-fixed pericardium. Surgical experience is important in these often complex cases.

Chordal shortening or translocation. Elongation of chordae allows the leaflets to prolapse into the left atrium. This defect may be repaired by trench shortening of the chorda, by a sliding repair of the split papillary muscle, or by replacing the chorda with Gortex. These are difficult and time-consuming techniques, and require that the surgeon have extensive experience.

Chordal fenestration and resection. Restricted leaflet movement is often the result of fibrotic chordal shortening, fusion, or hypertrophy, usually because of rheumatic valve disease. Resection or fenestration of thickened chordae may permit proper leaflet motion. Proper mobilization is difficult and only selected cases are successful.

Surgical Results

Comparative series have shown mitral valve repair to be effective, and to have fewer complications than mitral valve replacement. In our institution, we make all efforts to preserve the native mitral valve architecture. As part of this process, we have assembled a multidisciplinary team to evaluate and treat patients with significant mitral insufficiency. Of the approximately 250 patients who are evaluated at our institution each year, 25% have disease severe enough to warrant reconstructive surgery, and more than two-thirds of them undergo valve repair. The remaining one-third must have valve replacement because severely advanced disease has rendered the mitral valve elements unreconstructable.

At the present time, minimally invasive valve surgery has begun to exert its influence on cardiothoracic surgery. Our institution performed the first "minimally invasive" mitral valve repair in North America, and continues to explore new ways of correcting mitral valve disease, including surgery assisted by a thoracoscopic camera, and performed through a 3-inch incision in the right chest (Figure 3, next page) rather than a median sternotomy. To date, we have had excellent results; our patients have had minimal postoperative discomfort, shorter hospital stays, and earlier resumption of daily activities.[5]

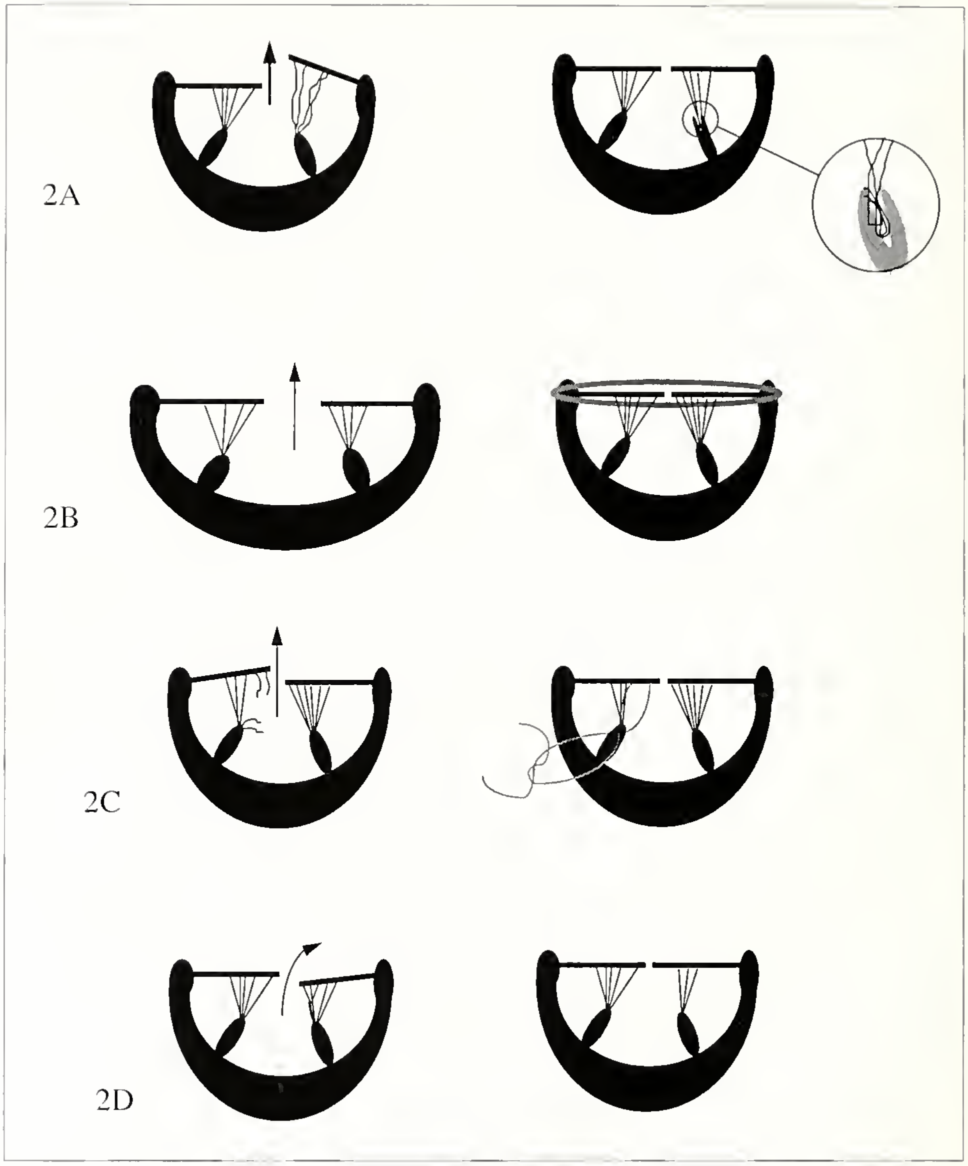

Fig 2: Strategies for mitral valve repair: A—Chordal elongation is repaired via a plastic chordal shortening procedure. B—Dilation of the annulus is repaired by installation of a prosthetic, flexible ring, which restores the normal orifice geometry. C—Mitral valve prolapse secondary to a chordal rupture is repaired with a new Gortex suture or translocation of another chord. D—Restriction of leaflet movement secondary to fusion and hypertrophy (leading to stenosis and regurgitation) is repaired via a chordal fenestration or resection procedure.

Conclusions

Mitral valve regurgitation presents a challenging clinical problem. Patients with this condition require astute medical management even when they are asymptomatic. They require routine monitoring with noninvasive imaging procedures such as two-dimensional echocardiography. Surgery should strongly be considered when patients develop left ventricular failure, NYHA class III symptoms, or atrial fibrillation. Surgical repair can be used preemptively to avoid left ventricular failure secondary to chronic ventricular overload. No matter the etiology of the mitral valve disease, we believe that efforts should be made to preserve the mitral valve architecture whenever possible. Repaired mitral valves have less postoperative left ventricular dysfunction, fewer thromboemboli, and do not require chronic anticoagulation.

Many cardiologists and cardiac surgeons still have reser-

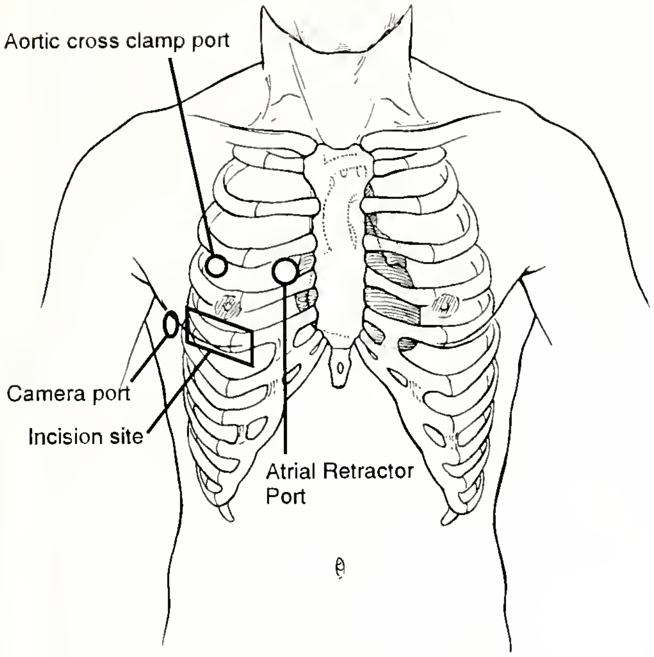

Fig 3: Surgical approach used at East Carolina University for minimally invasive repair of the mitral valve.

vations about mitral valve repair. They choose valve replacement because the technique is simpler and requires less time on cardiopulmonary bypass. However, we believe the increased risks of the repair operation are insignificant compared to the risks of long-term morbidity and mortality associated with prosthetic mitral valves. Mitral valve repair is now being performed in only a few centers. We believe this will change and that mitral valve repair will become available to more patients who need surgery for mitral valve regurgitation. ❑

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Rocky Mountain Spotted Fever Research at Wake Forest University School of Medicine

Harrell's Miracle on Hawthorne Hill

Caroline Seton Loeser, MSIV

Editor's note: This essay was one of two honored with the Irwin A. Brody Award for essays on the history of medicine. The award was sponsored by the Brody Fund for the History of Neurosciences and the Medical History Society at Duke.

The institutional histories written by Deans Coy Carpenter and Manson Meads use words like "faith" and "a miracle" to describe the establishment and early years of the Wake Forest University (formerly the Bowman Gray) School of Medicine in Winston-Salem.[1,2] The financial resources of the new medical school were a fraction of those thought to be needed to establish one.[1] Almost every leader in medical education criticized the plan.[1] And there was the looming presence of World War II. Yet Dean Carpenter, pressing forward with unshakable faith, assembled a remarkable faculty and laid the foundations for the medical school.

The first full-time faculty member Dean Carpenter recruited to the School was Dr. George T. Harrell. Harrell would serve the institution as a teacher, clinician, administrator, and researcher. In this article, I briefly describe his research contributions to our understanding of Rocky Mountain spotted fever, made while he was at Wake Forest.

Recruitment and Beginnings

Dean Carpenter believed that he could attract three kinds of faculty to the new medical school: young doctors who saw an opportunity to advance rapidly; those with already established scientific reputations who were dissatisfied in their current positions; and persons who were loyal to the institution and willing to take risks in order to contribute to the its development.[2] When Carpenter went to Duke University School of Medicine in late 1939, he was seeking a candidate of the first kind.

After hearing a lecture by Harrell on his sarcoid research, Carpenter approached him with an offer to join the new 4-year medical school in Winston-Salem. Harrell was already committed to another year at Duke as chief medical resident, and no chairman had yet been appointed to the Department of Medicine at Wake Forest. Nevertheless, Harrell's advisor, Professor Frederick Hanes, recommended that he accept the offer. The Board of Trustees of Wake Forest College elected him to the faculty on May 27, 1940. A local newspaper noted that Hanes recommended Harrell as a person who "...has shown more real scientific ability than any man I have ever had at Duke.... His original publications have been quite remarkable for a man of his age and his keenness for scientific investigation is marked by his excellent ability as a clinician."[3] Harrell reported to Winston-Salem on July 1, 1941, the day after he completed his residency.

The school had been open only 3 months when the December 7, 1941, attack on Pearl Harbor roused the nation to World War II. War increased the need for trained physicians to serve both the military and civilian populations. The Association of American Medical Colleges urged medical schools to accelerate their instructional programs so as to graduate a class every 9 months. Wake Forest, like all medical schools, had to certify

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This photograph of Dr. Harrell, taken in the late 1940s during his research into Rocky Mountain spotted fever, appeared in a yearbook dedicated to him at Bowman Gray School of Medicine (now known as Wake Forest University School of Medicine, Winston-Salem).

specific faculty as essential,[1] but even so lost many part-time faculty members to the armed forces. Despite the faculty losses (and a moratorium on recruiting additional members), and faced with an accelerated program, the faculty voted to increase its workload. The military required additional courses in tropical medicine, chemical warfare, and preventive medicine; these new courses were assigned to the faculty member with the greatest interest in infectious diseases, Harrell.

Early Research

The start of Harrell's work at Wake Forest coincided with the Rocky Mountain spotted fever season in North Carolina. At the time, Duke Hospital had reported only 8 cases, but in western North Carolina, Rocky Mountain spotted fever was endemic. There was no specific therapy, but Harrell recognized a relatively untouched research opportunity in the development of supportive therapy. As he stated in the introduction of one of his early papers "[e]xtensive research has been done on the recovery of the [Rocky Mountain spotted fever] organism, on the immunology of the disease, on the preparation of vaccines and hyperimmune serum, and on the use of chemotherapeutic agents to reduce the number of organisms.... We propose that some attention should now be paid to the sick patient."[4]

Harrell and his colleagues began their investigations on Rocky Mountain spotted fever with observations made at the bedside of patients in the course of daily care. As the disease progressed, the patients became edematous and their blood pressure fell. If intravenous glucose and sodium chloride were given, they worsened, even though their chemical values normalized. They became even more edematous and their blood pressure dropped precipitously.[5]

Harrell considered the intracellular localization of the causative organism (Rickettsia rickettsiae) in the endothelium of arteries a possible mechanism for the disturbances in circulation and fluid distribution.[5] He proposed that injury to small blood vessels produced physiologic changes analogous to those caused by burns or toxins: The damaged capillaries became highly permeable to plasma, water, and crystalloids, which leaked into the interstitial tissues; intravascular osmotic pressure decreased, and peripheral circulatory collapse followed. Intravenous glucose and saline would only aggravate the edema and might even worsen the condition. Since the patients were in peripheral circulatory collapse and hypoproteinemic, he argued, large amounts of plasma and whole blood should be given first, and then, clinical conditions permitting, intravenous fluids should be administered.[5] These bedside clinical observations, made over the course of 3 Rocky Mountain spotted fever seasons, became the basis for Harrell's first article on the "Treatment of Rocky Mountain spotted fever with particular reference to intravenous fluids: a new approach to basic supportive therapy," published in the *Journal of the American Medical Association* in December 1944.[5]

> "Harrell had faith in his clinical observations, and he persisted. He became convinced that the alterations in circulation and fluid distributions were caused by the rickettsial damage to the vessels."

Harrell's new approach ran counter to the prevailing dictum that intravenous fluids were harmful in Rocky Mountain spotted fever. Previous researchers theorized that patients died primarily from myocardial failure not peripheral circulatory collapse as Harrell proposed.[6] This is not a trivial distinction since the treatment for the two conditions is diametrically opposed. In myocardial failure one would limit fluids because they would harm a patient suffering from fluid overload, whereas withholding appropriate intravenous fluids would be harmful for someone with for peripheral circulatory collapse. As Harrell has stated this "was more that just philosophic; it was a very practical point."[6]

In the introduction of his 1944 article, Harrell reviewed the then current concepts of supportive therapy in Rocky Mountain spotted fever. Prior researchers, including Dr. Norman Topping, former assistant surgeon of the US Public Health Service and member of the Division of Infectious Diseases of the National Institute of Health, had concluded that patients did worse when given intravenous fluids. He felt there was more danger from over- rather than under-treatment.

Topping, working in the Montana RMSF laboratory, had developed a hyperimmune serum useful in treating the disease, but the serum was in short supply (and useless if used later than after the third day after rash had appeared). Topping had said in 1943 that "...any intravenous therapy is contraindicated."[7] Others who supported this approach included Dr. R.R. Parker, director of the Rocky Mountain Laboratory in Montana and Dr. David M. Martin in the Department of Pediatrics of Duke University. Courageously, Harrell, a young professor at a new medical school, a couple years out of residency and with no full-time technical support, had challenged the National Institutes of Health and the Montana laboratory established to study Rocky Mountain spotted fever.

Harrell had faith in his clinical observations, and he persisted. He became convinced that the alterations in circulation and fluid distributions were caused by the rickettsial damage to the vessels. He presented a paper and an exhibit (Figure, next page) connecting the pathologic anatomy of the disease to its clinical management at the 38th Annual Meeting of the Southern Medical Association in November 1944.[4] His exhibit was awarded second prize, the first national recognition of clinical research performed at the Wake Forest University School of Medicine.[8]

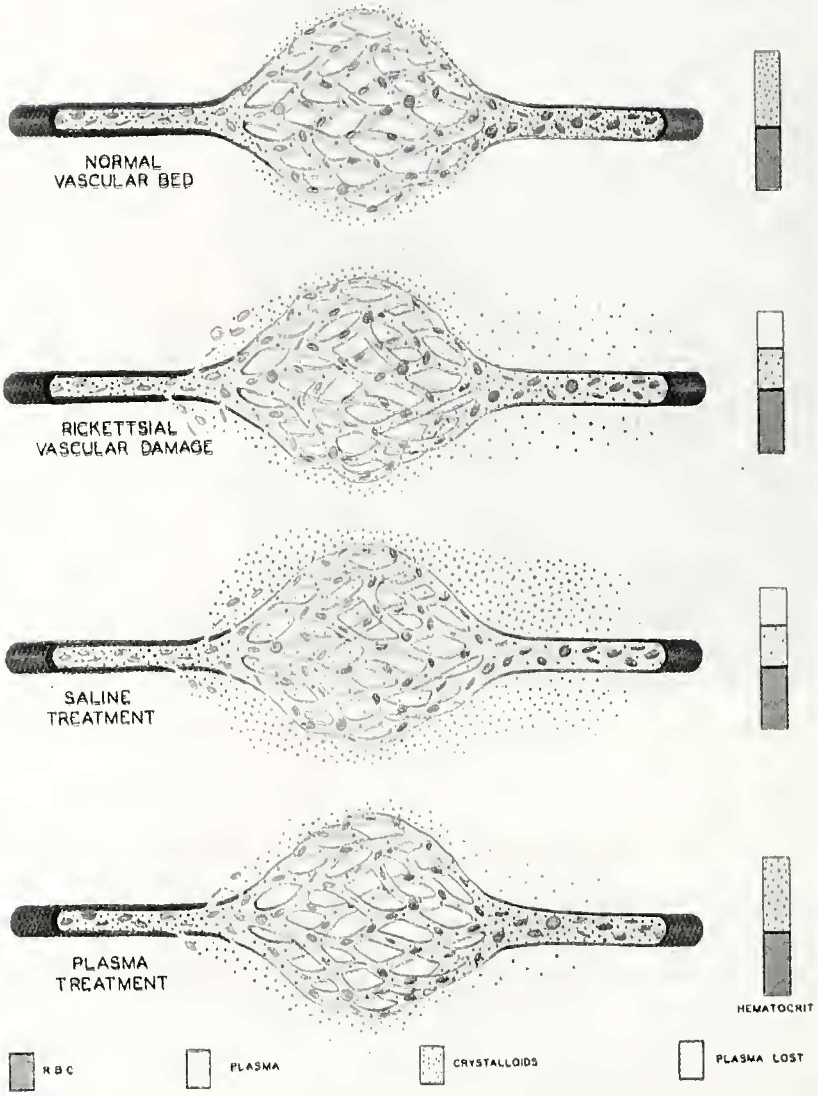

Fig: A diagram connecting the pathologic anatomy of Rocky Mountain spotted fever to its clinical management: The **top diagram** illustrates the normal extravascular crystalloid circulation. Pressure on the arterial side of the capillary bed (on the left) forces fluid out into the interstitial spaces. The fluid is reabsorbed on the venous side (on the right) by the colloid attraction of the intravascular proteins. The **second diagram** shows the loss of integrity of the vascular wall from necrosis caused by rickettsial damage. Extravasation of erythrocytes produces the rash. The **third diagram** depicts the loss of additional proteins from the bloodstream as a result of treatment by crystalloids. The crystalloids are then held outside the vascular tree by the protein that has been washed out. The **bottom diagram** illustrates the reabsorption of the crystalloids from the interstitial spaces by plasma introduced into the vascular system; the administration of plasma brings about the reabsorption by raising the intravascular osmotic pressure above that of the proteins still remaining outside the blood vessels. (Source: South Med J 1946;39:551-8.)

Volunteers and Funds

Considering the workload, stress, and resource limitations imposed by World War II, how did Harrell accomplish his research? He believed that clinical research was a direct and inseparable part of medical education.[9] He stimulated students' interest in research and involved house staff, dietitians, and faculty from Medicine, Pediatrics, and the hospital laboratories in his investigations.

In the 1940s, research funding was limited to grants from private sources such as the Rockefeller, Commonwealth, or Markle foundations. Harrell received a small gift in 1942 from the R.J. Reynolds Tobacco Company in Winston-Salem in gratitude for his assistance in controlling a fleaborne typhus outbreak.[10] This money allowed Harrell and his coworkers to carry out some of their first studies on Rocky Mountain spotted fever. However, the strain of limited resources soon showed. In summer 1945, Dr. William Wolff informed Dean Carpenter of the lack of resources for a chemical technician for the Rocky Mountain spotted fever project. Wolff pleaded for more help for the research efforts of the institution. As he noted, the Rocky

Mountain spotted fever research was "among the best of the clinical research projects now being carried out anywhere in America."[11]

Fortunately, in April 1954, Harrell had applied to the John and Mary R. Markle Foundation for funds to continue and expand the Rocky Mountain spotted fever work and to continue studies of trichinosis that he had started at Duke. The Foundation awarded Harrell $3,500 a year for two years. This amount would underwrite the salaries of two technicians (one for the trichinosis study), and the purchase of animals and supplies. Once a technician was hired, some of the stress of research was relieved. Harrell received subsequent limited funding from the Office of Naval Research and the US Public Health Service for other research programs.

> "From its start in 1941, Harrell contributed to the success of the Wake Forest University School of Medicine through his roles as a researcher, clinician, teacher, and administrator. During a time of tremendous financial limitation and stress, he produced some of the finest research in the country."

The Definitive Clinical Review

Harrell and colleagues continued to explore ways to keep Rocky Mountain spotted fever patients alive until they developed immunity to the rickettsia. The vascular changes were measured by studying the effects of early administration of hyperimmune antiserum on skin lesions. Once the value of high-protein diets had been demonstrated, members from the Department of Dietetics developed a simple high-protein diet to offset nitrogen loss and prevent circulatory changes.[12] Harrell's team studied management of Rocky Mountain spotted fever in children and adolescents; they evaluated the effects of specific and supportive therapies on the alterations in blood volume and thiocyanate space at various stages of the disease. Only crude techniques were available to describe the pathogenesis of the peripheral circulatory failure, and it was impossible to obtain new, more accurate instruments. Still, Harrell was ready with susceptibility tests and blood assays to determine the usefulness of a new antibiotic (flown down by the company that developed it) for trial in a few patients. Its spectacular ("Golden") success against Rocky Mountain spotted fever led to its name, Aureomycin. A new era had begun.

Harrell summarized all of his studies and those of other researchers in a clinical review article titled "Rocky Mountain Spotted Fever," published in *Medicine* in December 1949.[13] The article described all aspects of the disease including epidemiology, pathological anatomy and physiology, clinical course, diagnosis, treatment, and prevention. It indicated that antibiotics were a milestone in the treatment of the disease. The article was a great success. In response to a request for a reprint, the publisher wrote that the "response to the article was beyond our expectations and the supply of reprints allotted by the publisher was quickly exhausted." So Harrell had the type reset, added a few illustrations not included in the original, and had more reprints made. The article "stood for decades as definitive in clinical practice"[14] relating to Rocky Mountain spotted fever, and continues to be cited into the 1990s. It was reprinted in 1992 in slightly abbreviated form as one of the "Classics in Medicine."[15]

Dr. George Harrell

Radioisotopes: Lead to Gold

President Eisenhower proposed nonmilitary, peacetime applications of atomic energy. Harrell and Dr. Wilburt Davison, dean of Duke University School of Medicine, were appointed to the Medical Advisory Panel of the Oak Ridge (Tennessee) Institute of Nuclear Studies (even though Wake Forest was not a member of the Institute). This gave Harrell access to radioactive potassium directly from Oak Ridge for the study of nuclear membrane permeability, but it was necessary to get the short-lived radioisotope to Winston-Salem before it decayed beyond usability. Since the isotope was available from the Oak Ridge reactor only on early Tuesday mornings, Harrell set up a special system of transport. A lead pig containing the radioisotopes had a first class seat reserved on the only nonstop flight from Knoxville to Smith Reynolds airport in Winston. Harrell would meet the plane at the airport with a police escort to take him across town to the School of Medicine.[8]

Camille Artom, an internationally recognized biochemist at Wake Forest, assisted Harrell in applying radioisotopes to the clinical study of diseases. A new laboratory was constructed using household stainless steel kitchen cabinets to control any spills of radioisotope. Harrell used radioactive potassium to study changes in capillary and cellular permeability in infections. Antibiotics had already drastically reduced the number of cases of Rocky Mountain spotted fever admitted to Wake Forest University's Baptist Hospital, so if no case was available when the potassium arrived from Oak Ridge, it was used on volunteer patients with other infectious diseases. In effect, they came to serve as a control group for Rocky Mountain spotted fever observations. When it was recognized that there were no data for total body exchangeable potassium in females, the isotope was given to a group of volunteers: nurses, secretaries, medical students, and others who served as second controls.

The results of Harrell's studies were presented at the 47th Annual Meeting of the Southern Medical Association in October 1953. Harrell won first prize for original scientific research for his exhibit titled "Changes of sodium and potassium in man." This work lead to his participation at International Physiologic Congresses in Montreal and Oxford.

Conclusions

Radioisotope methods allowed more accurate pathophysiological studies in Rocky Mountain spotted fever, but the widespread availability of antibiotics brought cure so quickly that the availability of acutely ill patients for further investigations was greatly reduced. Harrell continued his studies by evaluating the residual effects of the disease in the brain (by electroencephalogram) and the myocardium (by electrocardiogram) in recovered patients. Harrell found that the early headache and sensitivity to light were caused by the same lesion in the brain that later appeared in the skin. Damage to the myocardium, confirmed by autopsy, included a coronary thrombus in a 7-year-old.[16]

From its start in 1941, Harrell contributed to the success of the Wake Forest University School of Medicine through his roles as a researcher, clinician, teacher, and administrator. During a time of tremendous financial limitation and stress, he produced some of the finest research in the country. His approach began with observations at the bedside of patients with Rocky Mountain spotted fever and led to national recognition for his elucidation of the underlying pathophysiology. His clinical review of Rocky Mountain spotted fever has become a classic. Harrell's work is truly one of the miracles on Hawthorne Hill. ❑

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of the North Carolina Medical Society

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CME Calendar

September 18-19
Geriatrics Symposium
Place: Winston-Salem
Credit: 9 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

September 18-19
Carolinas Occupational and Environmental Medicine Association Annual Symposium
Place: Siena Hotel, Chapel Hill
Credit: 10 hours Category 1, AMA (pending)
Fee: $150
Info: NC Education & Research Center, UNC-Chapel Hill, 109 Conner Drive, Suite 1101, Chapel Hill 27514, 919/962-2101, fax: 919/966-7579, *e-mail:* oshercww@sph.unc.edu

September 22
Women & Children Mental Health Series: The Behavioral Healthcare—Implications of Welfare Reform
Place: WakeMed, MEI, Room 1&2
Fee: $25
Info: Wake AHEC-Mental Health, 3024 New Bern Ave., Suite G03, Raleigh 27610-1255

September 23-26
5th Annual Multidisciplinary Duke Heart Center Conference: Shaping the Future—Innovations in Technology, Quality and Caring
Place: Durham Marriott at the Civic Center
Credit: 20.4 hours Category 1, AMA
Fee: Non-Duke employees: $290, Duke affiliate employees: $225, Duke/DCRI/Durham Regional employees: $120
Info: Hospital Education, Box 3883 DUMC, Durham 27710, fax: 919/681-6251

September 25-27
Diabetes: Advances in Management and Prevention
Place: Pinehurst Resort & Country Club
Credit: 13.5 hours Category 1, AMA & AAFP
Fee: SMA member: $395, joining member: $495, nonmember: $595, resident/fellow & nonphysicians: $295
Info: Southern Medical Association, P.O. Box 190088, Birmingham AL, 35219-0088, 800/423-4992, fax: 205/945-8885

September 25-27
Comprehensive Gynecology: Clinical Update for Practicing Physicians
Place: Crowne Plaza Manhattan, New York, NY
Credit: 13.5 Category 1, AMA
Fee: $575
Info: Center for Bio-Medical Comm., Inc., 201/385-8080 ext. 26, *e-mail:* jrosenberg@cbcbiomed.com

October 2
Women & Children Mental Health Series: Organic Brain Syndrome in Children
Place: Charlotte AHEC
Fee: $25
Info: Charlotte AHEC/MH Registrar, P.O. Box 32861, Charlotte 28232-2861

October 2
Rheumatology Update for the Primary Care Physician
Place: Winston-Salem
Credit: 6 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

October 2-4
5th Annual Joint Meeting: NC and SC Chapters, American College of Cardiology
Place: Westin Hotel, Hilton Head, SC
Info: NC ACC, 4101 Lake Boone Trail, Suite 201, Raleigh 27607, 919/787-4916, *e-mail:* MADilday@compuserve.com

October 8-11
3rd Annual Integrating Mind, Body, and Spirit in Medical Practice Conference
Place: Embassy Suites Hotel, Cary
Fee: physicians: $595, nonphysicians: $495; Fri. & Sat. only—physicians: $365, nonphys.: $295
Info: sponsored by Duke University Medical Center, contact: Hospital Education, Box 3883 DUMC, Durham 27710, fax: 919/681-6251

October 8-11
Coastal Medical Retreat and 15th Aesculapian Sports Classic
Place: Kingston Plantation, North Myrtle Beach, SC
Info: Beth Mixon, Coastal Area Health Education Center, 910/343-0161, ext. 312, or Bonnie Brown, New Hanover-Pender County Medical Society, 910/790-5800

October 9-11
"When Bad Things Happen to Good Doctors": How to Survive in a Hostile Environment Without Selling Out Your Ethics or Patients
Place: Crabtree Valley Marriott, Raleigh
Info: Assn. of American Physicians and Surgeons, 800/635-1196

October 14-18
Infectious Disease Board Review
Place: Ritz-Carlton Tysons Corner, McLean, VA
Credit: 41 hours Category 1, AMA
Fee: physicians: $895, physicians-in-training: $695
Info: Center for Bio-Medical Comm., Inc., 201/385-8080 ext. 26, *e-mail:* cmeinfo@cbcbiomed.com

October 16-17
5th Fall Symposium on Atherosclerosis
Place: Blowing Rock
Credit: 6 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

October 22
Women & Children Mental Health Series: Organic Brain Syndrome in Children
Place: WakeMed, MEI, Room 1&2
Fee: $25
Info: Wake AHEC-Mental Health, 3024 New Bern Ave., Suite G03, Raleigh 27610-1255

October 22-24
Cases in Echocardiography
Place: Heart House, Bethesda, MD
Credit: 17.5 hours Category 1, AMA
Fee: ACC member: $549, nonmember: $599
Info: American College of Cardiology, Attn: Learning Center, P.O. Box 79231, Bethesda, MD, 21279-0231, 800/253-4636, ext. 654

October 25-28
Advances in Physiology and Pharmacology
Place: White Sulphur Springs, WV
Credit: 17 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

October 28-31
American Medical Writers Assn. Annual Conference: Biomedical Communication in a Changing World
Place: Vancouver, British Columbia
Info: AMWA, 9650 Rockville Pike, Bethesda, MD 20814, 301/493-0003, fax: 301/493-6384, *e-mail:* amwa@amwa.org, *Internet:* http://www.amwa.org

October 29-November 1
Medicine for the Third World Traveler
Place: Nicholas School of the Environment, Duke Univ., Durham
Credit: 27 hours Category 1, AMA
Info: Julie D. Gay, Administrative Director, Continuing Education Program, Nicholas School of the Environment, Box 90328, Duke University, Durham 27708-0328, 919/684-8082, fax: 919/684-8741, *e-mail:* britt@duke.edu

October 30
Conference on Medical Response to Domestic Violence
Place: Friday Center, UNC-Chapel Hill
Credit: 5.5 hours Category 1, AMA
Fee: $95 (by Oct. 15)
Info: conference on developing physicians' clinical skills to improve the health of domestic violence victims; sponsored by the Beacon Program at UNC Hospitals; contact Deedra Donley, UNC Office of Continuing Education, 919/962-2118, fax: 919/962-1664

October 30-November 1
19th Mountain Medical Meeting
Place: Asheville
Credit: 12 hours Category 1, AMA
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

November 2
Women & Children Mental Health Series: Sexual & Physical Abuse of Women— Implications for Women's Health
Place: Charlotte AHEC
Fee: $25
Info: Charlotte AHEC/MH Registrar, P.O. Box 32861, Charlotte 28232-2861

November 3
Women & Children Mental Health Series: Infants & Toddlers with Feeding Problems & Young Children with Attachment Disorders
Place: Charlotte AHEC
Fee: $25
Info: Charlotte AHEC/MH Registrar, P.O. Box 32861, Charlotte 28232-2861

November 4-6
13th Physician's Office Laboratory Symposium
Place: Charlotte Hilton
Credit: 22 hours, laboratory director certification for physicians
Fee: physicians: $495, nonphysicians: $545
Info: Office of CME, Wake Forest University School of Medicine, 336/716-4450 or Physician Access Line (PAL) 800/277-7654

November 10
Women & Children Mental Health Series: Sexual & Physical Abuse of Women— Implications for Women's Health
Place: Mariah Parham Hospital, Auditorium, Henderson
Fee: $25
Info: Wake AHEC-Mental Health, 3024 New Bern Ave., Suite G03, Raleigh 27610-1255

November 12-15
NCMS Annual Meeting
Place: Sheraton Imperial Hotel, Research Triangle Park
Info: Contact Dana Hammermeister, NCMS, 800/722-1350 or 919/833-3836, fax: 919/833-2023 *Internet:* http://www.ncmedsoc.org

November 13-14
1st Annual Co-Sponsored Duke/UNC Oncology Symposium: Critical Issues in Thoracic Oncology
Place: Pinehurst Resort & Country Club
Credit: 7.5 hours Category 1, AMA
Fee: $95
Info: Office of CME, Box 3108 DUMC, Durham 27710, 919/419-5500, fax: 919/681-7462

Continued

November 14-15

25th Alexander Spock Symposium: Practical Management of Common Problems in Ambulatory Pediatric Patients

Place: Searle Center, Duke University Medical Center, Durham
Fee: physicians: $150 both days (or $100 for Saturday, $50 for Sunday); allied health professionals: $90 (free for physicians or allied health professionals in training)
Info: Joseph Marc Majure, MD, Box 2994 DUMC, Durham 27710, 919/684-2289, fax: 919/684-2292

November 17

Women & Children Mental Health Series: Infants & Toddlers with Feeding Problems & Young Children with Attachment Disorders

Place: Wake AHEC, MEI, Room 1 & 2
Fee: $25
Info: Wake AHEC-Mental Health, 3024 New Bern Ave., Suite G03, Raleigh 27610-1255

November 18-21

MEDICA 98: 30th World Forum for Physicians' Practices and Hospitals

Place: Fairgrounds, Dusseldorf, Germany
Info: Dusseldorf Trade Shows, Inc., 150 N. Michigan Ave., Suite 2920, Chicago, IL 60601, 312/781-5180, *Internet:* http://www.dtsusa.com/dts/

December 1

Women & Children Mental Health Series: Children with Sleep Disorders/Sleep Problems

Place: Charlotte AHEC
Fee: $25
Info: Charlotte AHEC/MH Registrar, P.O. Box 32861, Charlotte 28232-2861

December 1

Women & Children Mental Health Series: Child Pharmacology

Place: Charlotte AHEC
Fee: $25
Info: Charlotte AHEC/MH Registrar, P.O. Box 32861, Charlotte 28232-2861

December 4

Women & Children Mental Health Series: Diagnosis of Premenstrual Dysphoric Disorder

Place: Charlotte AHEC
Fee: $25
Info: Charlotte AHEC/MH Registrar, P.O. Box 32861, Charlotte 28232-2861

December 6-9

26th Annual Conference on Heart Disease

Place: Williamsburg Lodge, Williamsburg, VA
Credit: 18.5 Category 1, AMA
Fee: ACC member: $470, nonmember: $565, fellows/residents/PAs/nurses: $295
Info: American College of Cardiology, Attn: EP, P.O. Box 79231, Bethesda, MD, 21279-0231, 800/253-4636, ext. 695

December 7

Women & Children Mental Health Series: Children of Mothers/Parents with Mental Illness

Place: Charlotte AHEC
Fee: $25
Info: Charlotte AHEC/MH Registrar, P.O. Box 32861, Charlotte 28232-2861

December 8

Women & Children Mental Health Series: Children with Sleep Disorders/Sleep Problems

Place: Wake AHEC, MEI, Room 1 & 2
Fee: $25
Info: Wake AHEC-Mental Health, 3024 New Bern Ave., Suite G03, Raleigh 27610-1255

December 10

Women & Children Mental Health Series: Mental Health's Role in Distinguishing PTSD in Children, Families, and Helpers After a Disaster

Place: Wake AHEC, Raleigh
Fee: $25
Info: Wake AHEC-Mental Health, 3024 New Bern Ave., Suite G03, Raleigh 27610-1255

December 14

Women & Children Mental Health Series: Children of Mothers/Parents with Mental Illness

Place: WakeMed, MEI, Room 1&2
Fee: $25
Info: Wake AHEC-Mental Health, 3024 New Bern Ave., Suite G03, Raleigh 27610-1255

December 15

Women & Children Mental Health Series: Diagnosis of Premenstrual Dysphoric Disorder

Place: WakeMed, MEI, Room 1&2
Fee: $25
Info: Wake AHEC-Mental Health, 3024 New Bern Ave., Suite G03, Raleigh 27610-1255

December 16

Women & Children Mental Health Series: Pre- and Postpartum Psychiatric Disorders & Medical Management of Pregnant or Nursing Mothers

Place: WakeMed Education Institute
Fee: $25
Info: Wake AHEC-Mental Health, 3024 New Bern Ave., Suite G03, Raleigh 27610-1255

January 14

Women & Children Mental Health Series: Helping Parents Understand and Manage Infant and Toddler Behavior

Place: WakeMed, MEI, Room 1 & 2
Fee: $25
Info: Wake AHEC-Mental Health, 3024 New Bern Ave., Suite G03, Raleigh 27610-1255

January 28

Women & Children Mental Health Series: Helping Parents Understand and Manage Infant and Toddler Behavior

Place: Charlotte AHEC
Fee: $25
Info: Charlotte AHEC/MH Registrar,
P.O. Box 32861,
Charlotte 28232-2861

February 11

Women & Children Mental Health Series: Working with Multi-Challenged Families and Their Infants

Place: WakeMed, MEI, Room 1 & 2
Fee: $25
Info: Wake AHEC-Mental Health, 3024 New Bern Ave., Suite G03, Raleigh 27610-1255

February 25

Women & Children Mental Health Series: Working with Multi-Challenged Families and Their Infants

Place: Charlotte AHEC
Fee: $25
Info: Charlotte AHEC/MH Registrar, P.O. Box 32861, Charlotte 28232-2861

April 23-30

58th Annual American Occupational Health Conference

Place: Ernest N. Morial Convention Center, New Orleans
Info: American College of Occupational and Environmental Medicine, Education Dept., 55 W. Seegers Road, Arlington Heights, IL 60005, 847/228-6850, ext. 180,
Internet: http://www.acoem.org

March 10-13

NCMS Spring Conference & Leadership Symposium

Place: Embassy Suites Hotel, Cary
Info: Contact Dana Hammermeister, NCMS,
800/722-1350 or 919/833-3836.
fax: 919/833-2023
e-mail: dhammermeister@ncmedsoc.org
Internet: http://www.ncmedsoc.org

May 19

NCMS 150th Anniversary Gala

Place: Raleigh Memorial Auditorium
Info: with the North Carolina Symphony,
black tie optional; contact
Dana Hammermeister, NCMS,
800/722-1350 or 919/833-3836,
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BOARD-CERTIFIED OBSTETRICIAN-GYNECOLOGIST: in solo practice for 13 years in the Midwest wishes to join a group practice again. Will be available starting spring 1999. Please forward response to P.O. Box 5544, Jacksonville, IL 62650.

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FULL-TIME/PART-TIME PHYSICIAN: Outer Banks, Emergency Care/Family Practice Center in Nags Head, North Carolina. Excellent practice in a beautiful coastal community. Emergency Medicine experience is necessary. Competitive salary and benefit package. Part-time positions available with accommodations provided. Call Dr. Kimberly Keith at 888/503-2050 or Dr. Lewis Siegel at 757/670-8894.

PHYSICIANS NEEDED for locum tenens and permanent assignments in North Carolina family, walk-in, and occupational health care clinics. Mail your CV to Physician Solutions, P.O Box 98313, Raleigh, NC 27624.

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PSYCHIATRIST, JACKSONVILLE, NC: Full- or part-time, minimal managed care. Emerald Isle or Topsail Beach. Call Joe Colligan, MD, 910/455-5551.

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Collection Service	-	I. C. System	(800) 685-0595
Fax & Copier Machines/Equipment	-	DANKA	(800) 653-2652
Financial Management & Investments	-	Mercer Global Advisors (MGA)	(800) 335-8808
MasterCard Program	-	BB&T	(800) 476-4228
Group Purchasing Program	-	Shared Services Healthcare, Inc. (over 400 products & services available for your practice)	(800) 827-0340
Hotel/Dining Savings	-	Quest International (Code: 1931)	(800) 782-9450
Insurance	-	The Medical Mutual Group (Offering professional, personal, group, etc. insurance & service)	(800) 662-7917
Magazine Program	- -	NCMS Magazine Program Our State Magazine	(800) 289-6247 (800) 948-1409
Practice Management Series	-	NC Medical Society Seminar Program	(800) 722-1350 (919) 833-3836
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For more information, contact the NC Medical Society: (800) 722-1350, or visit our website at: www.ncmedsoc.org

1/23/98

Millions Victimized by Family Members Every Year!

Are you concerned about the effects of family violence and victimization within your community?

Become an advocate within your community for the prevention of family violence.

Violence among family members has reached staggering proportions. Every year more than 2 million cases of child abuse and neglect are reported, between 2 and 4 million women are battered by their spouses, and between 700,000 and 1.1 million of the elderly population are abused.

The American Medical Association has formed a *National Coalition of Physicians Against Family Violence*. Through the *Coalition* the American Medical Association hopes to involve you in activities that address issues of child abuse, sexual assault, domestic violence and elder abuse because you have the unique ability to identify the symptoms, first-hand. By joining the *National Coalition* you will be showing your concern about the effects of family violence and victimization, and will become a committed advocate within your community for the prevention of family violence.

Through the *Coalition* you will:
- be informed about local contacts and referrals
- become aware of local and regional resources
- be provided with information regarding model educational programs
- become aware of treatment guidelines and protocols.
- have access to newsletters, public education materials and other publications
- receive an official membership card and frameable poster alerting your patients of your interest in and concern for this problem.

The only **cost** to you **is your commitment** to help curb this problem. Simply complete the membership application form below and mail to the Department of Mental Health, American Medical Association, 515 N. State Street, Chicago, IL 60610.

Yes, include my name in the *Coalition's* membership

Name ____________________

Address ____________________

City/State/Zip ____________________ Telephone # ____________________

Specialty ____________________

Auxiliary Member ☐ Yes ☐ No Other ____________________

Area of interest within Family Violence: ☐ Child Abuse ☐ Sexual Assault ☐ Domestic Violence ☐ Elder Abuse ☐ Other

American Medical Association
Physicians dedicated to the health of America

Aphorisms of the Month

Daniel Sexton, MD, Section Editor

"Musings About Government, Disease, Food, and Books"

A government that robs Peter to pay Paul can always count on the support of Paul.
—*George Bernard Shaw*

Physicians and public health officials, like soldiers, are always equipped to fight the last war. —*Rene Dubos*

Disease creates poverty and poverty disease.
The vicious circle is closed. —*Henry Sigerist*

If you start to think about your physical or moral condition, you usually find that you are sick.
—*Goethe*

The trouble is not in science but in the uses men make of it. Doctor and layman alike must learn wisdom in their employment of science, whether this applies to atom bombs or blood transfusion. —*Wilder Penfield*

We do not eat for the good of living, but because the meat is savory and the appetite is keen.
—*Ralph Waldo Emerson*

Great eaters and great sleepers are incapable of anything else that is great. —*Henry IV of France*

It is much easier to buy books than to read them, and easier to read them than to absorb their contents.
—*British Medical Journal, 1909*

In science, read, by preference, the newest works; in literature, the oldest. —*Edward Bulwer-Lytton*

Section editor is Dr. Dan Sexton, Box 3605, DUMC, Durham, NC 27710. e-mail: sexto002@mc.duke.edu

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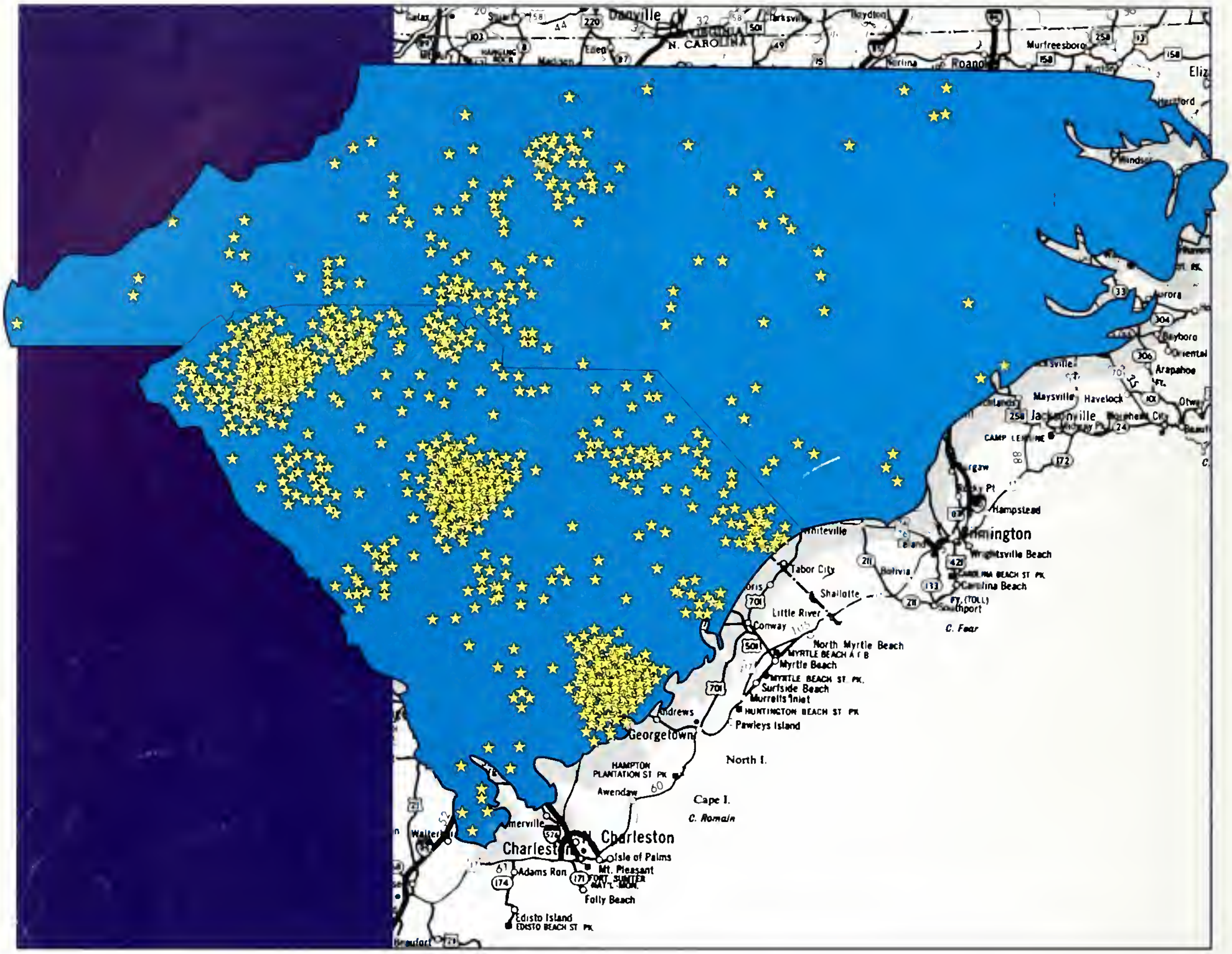

What can a map tell you about a computer system?

Plenty — if, like this one, it shows how many medical offices in the Carolinas use a particular practice management system to run more efficiently, effectively, and profitably.

For example, it might show how a 16-year commitment to "Working for Physicians" has resulted in over 800 installations in North and South Carolina.

It might bring home how features like "on-the-fly" refiling, encounter-form tracking, and direct transmission to North Carolina Medicare, Medicaid, and Blue Cross/Blue Shield (with no per-claim charges) are improving physicians' revenue.

It could clarify how critical "one-call" support can be in helping offices stay productive — how telephone support staff, software and hardware engineers, technicians, trainers, and a fleet of service vans can provide support unmatched in the industry.

It might demonstrate how ongoing research and development brought innovations like the first integrated, direct electronic claims transmission in a practice management system.

Or it could validate the concept of regional focus: By selling systems only in the Southeast, a computer company can keep customers up-to-date on the latest insurance filing requirements.

It could emphasize the flexibility of multi-user, multi-tasking software that runs on the most popular operating system in the world.

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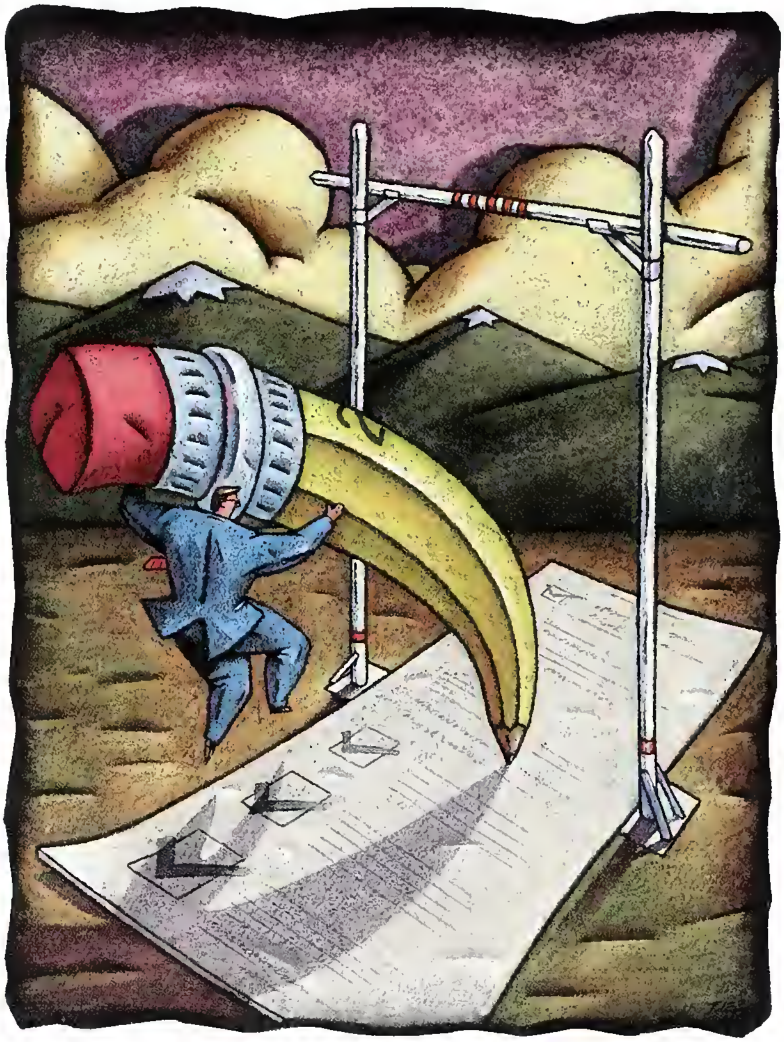

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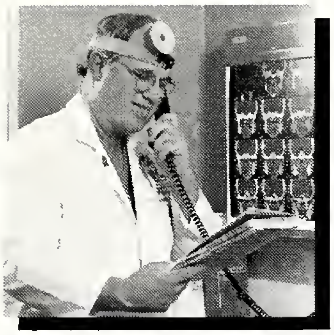

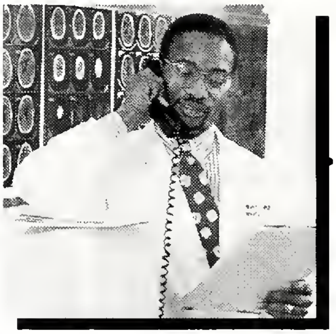

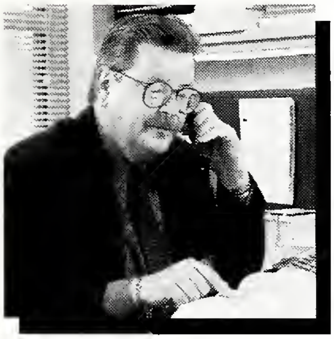

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For Doctors and their Patients

November/December 1998, Volume 59, Number 6

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NORTH CAROLINA MEDICAL JOURNAL
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exhibit A:

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North Carolina Medical Journal

FOR DOCTORS AND THEIR PATIENTS

November/December 1998, Volume 59, Number 6

Cover: "Polar Watch," is Dr. Joseph Nicastro's rendering of one of the residents of the North Carolina Zoo in Asheboro. Dr. Nicastro is a retired professor of orthopedics at Wake Forest University School of Medicine. He owns his own art studio in Winston-Salem and specializes in realistic portraiture and tableaux. Used with permission.

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Letters to the Editor ✍

A Letter From the Editor

I want you, the readers, to know how much I appreciate the letters and e-messages we have received in the Editorial Office in support of the *Journal*. It is reassuring to know that there are many who are worried about its now somewhat uncertain future. Shortly after this issue of the *Journal* reaches its readers, the Society will vote at its Annual Meeting on whether to continue publication or not. I have been impressed by the wisdom displayed by the assembled delegates to the Annual Meeting; the collective action of the delegates often surpasses in sensibility that of their elected leaders. I urge any and all of you who read this and who care about the *Journal* and what it represents to vote for its retention and survival. This is the time for lobbying and politics! The time for all good men and women to come to the aid of our cause!

We can make a number of good and logical arguments about why the *Journal* is important—to the Society, to the profession, to medical students, to the public. But the overriding issue, in my mind, is one: just what kind of Society do we want to be? I certainly would like everyone who receives the *Journal* to read every page of every issue. But even if no one ever did, it would still be important for the North Carolina Medical Society to publish a *medical* journal. Because of what it says about us a group: that having a professional life is what we are about, that a deeper concern with the substance of what we do is what sets us apart from tradespeople and jacklegs. If the body of medical professionals in NC does not think that kind of stance important, does not recognize that publishing a journal sends to young doctors and students a message regarding what we stand for and believe in, then we are in perilous waters indeed. The *Journal* keeps the Society in balance, just by being. To extinguish the spark of professionalism, to take it out of the hands of practicing doctors, to abandon it to the professional academics is to strike at the heart of what makes Medicine a learned profession.

Do we want to undo ourselves? I hope not. I urge you to fight against it. Remember what Chaucer said about the pitfalls of professional life: "If gold ruste, what should iren do?" We are not good enough to be called golden; we need to be ever vigilant lest the rust begin.

—Francis A. Neelon, MD

To the Ramparts: Readers Write in Support of the Journal

To the Editor:

I was shocked to learn that publication of the *North Carolina Medical Journal* is in jeopardy (NC Med J 1998;59:280, 282, 283). As a practicing cardiothoracic surgeon at the University of North Carolina Hospitals, I find this journal informative and engaging. It keeps me abreast of medical activities in the state and informs me of the views of medical leaders in North Carolina. That small portion of my yearly dues to the Medical Society that goes toward publication of the *Journal* is well worth it, in my view. Suspending its publication will sever one of the few remaining links between medical practitioners in the state. I hope Medical Society delegates will defeat this short-sighted proposal of the Executive Council.

Charles S. Roberts, MD, Assistant Professor of Surgery
Division of Cardiothoracic Surgery
UNC School of Medicine
CB# 7065, 108 Burnett-Womack Bldg.
Chapel Hill, NC 27599-7065

To the Editor:

Please include my voice to those in the avalanche I expect to oppose the proposed "suspension" of the *Journal*.

There is much unique about the *NCMJ*: It provides both doctor and patient education, particularly in circumstances having to do with North Carolinians. It is a forum for many practice, public health, historical, and ethical issues. It cements the bond among many different types of health care providers in the state. There is a significant tradition associated with the publication itself.

Granted, website, e-mail, and, for that matter, more voluminous mailings are alternatives, but these too cost time and money. One would question the significance of any savings that would be generated to pursue other worthy goals of the North Carolina Medical Society.

Dale W. Oller, MD
Director of Trauma Services, WakeMed
Raleigh, NC 27610
doller@med.unc.edu *at Internet*

To the Editor:

Like the Editorial Board, I view the word "suspension" with the skepticism of the convicted felon about to be hanged who was told that he was to be only "suspended" at a certain time in a certain place. As Dr. Bob Prichard and I pointed out (Felts JH, Prichard RW. The Charlotte Medical, 1892-1925. NC Med J 1990;51:35-42) many North Carolina medical publications have been suspended, never to be resurrected.

The derivation of the word "doctor" speaks to the root of the matter. A physician in earlier times only dosed, usually with physic, a purgative, without the assurance of some knowledge that a doctor's degree gave. For that degree proclaims that rather high standards have been met and its holders are sufficiently qualified. The title "doctor" is derived from the Latin verb, *docere*, to teach. But to teach one must know, must learn and study without remission if he or she is to teach colleagues and particularly patients.

Before being a ready speaker and listener, the doctor must know words and their value in apt expression and to do so should read widely. Books, monographs, journals, professional meetings, and conversation are absolutes in such pursuits. And that pursuit includes some appreciation of the history of medicine so we can hope to avoid the errors of our predecessors and the hubris implicit in dogma and certainty. How sad that the *North Carolina Medical Journal* would be "suspended," denying us and generations after part of the medical story of our times and place.

When Bob Prichard introduced me to the members of the North Carolina Medical Society in September 1974 as his successor as editor of the *Journal*, he wrote that it was the "chronicle of North Carolina medical affairs that has no substitute presently." Now the need for such a chronicle has been questioned, and there are those who see little reason to continue its publication. When I relinquished the editorship in 1984 because I no longer had the time to satisfy myself in the task, I left 5 questions for the Society to consider. Since they are more relevant now than in 1984, I ask them again and quote from my farewell editorial:

"In such times what is expected of a state medical journal? How can it best represent its parents? How is the *North Carolina Medical Journal* to survive as an effective instrument of medical education? What cost is acceptable to the sponsoring Society? What sort of and how much attention should be devoted to socioeconomic, political, and administrative matters in our pages?"

The Executive Council has now decided that it expects nothing and that the Society does not need the *Journal*. Presumably better means exist, unidentified, for chronicling the activities of the Society. The medical, historical, and archival value of the publication is not questioned. It simply costs too much, one critic even resenting that the Editorial Board would seek funds for maintaining the *Journal*. Yet the Board is as entitled as other arms of the Society to lobby for financial support. Certainly the Board's near-unanimous desire to continue publication deserves careful consideration and enlightened debate.

John Felts, MD
Journal Editor, 1974-1984
3335 Paddington Lane
Winston-Salem, NC 27106

To the Editor:

I personally support the Editorial Board of the *Journal*, and I commend Dr. Neelon for the reasons he stands committed to its continued publication. Maybe it's worth investigating whether the *Journal* could procure funding from some other source and stand alone financially. As an independent publication, the *Journal* could remain a true medical journal, and not end up as a trade or union report.

I look forward to the House of Delegates meeting in November and will do what I can locally to support the *Journal*.

W. Grimes Byerly, MD, FACS
1446 Sixth St. Circle Court, NW
Hickory, NC 28601

To the Editor:

I am appalled at the suggestion that the *Journal* be "suspended." It is quite obvious that suspension is tantamount to discontinuance.

Many *Journal* articles are unique to the medical scene in North Carolina, are written in language understandable by almost anyone, and would not otherwise be published. Among the multiple publications I receive, this is one that I always read and enjoy.

I sincerely hope that our delegates will vote to continue the *Journal*. I, for one, would be willing to earmark a contribution just for its publication.

I have contacted our Mecklenburg delegates to urge that they defeat this proposal.

Charles W. Tillett, MD
2130 Sharon Lane
Charlotte, NC 28211

To the Editor:

I am so sorry that our modern Editorial Board has to work so hard to convince our profession of the importance for the need to continue our publication.

I look forward to receiving the *Journal* every two months, and I enjoy its contents.

Abe Lawrence Feuer, MD, FACS
1006 Fairfield Drive
Gastonia, NC 28054

To the Editor:

If Medical Society President Dr. Charles Garrett and other members of the Executive Council fail to rescind their resolution to suspend publication of the North Carolina Medical *Journal*, it will be a dark day for the medical profession, here and elsewhere.

Failure to continue to publish the *Journal*, and instead, devote that money to "tort reform and managed care," is market-driven, economic shortsightedness in the extreme.

The *Journal* represents the intellectual underpinnings of the profession of medicine as practiced in the state of North Carolina. If the President and Council members wish to have the North Carolina Medical Society degenerate into a trade union, then such an economic move it quite rational. It is also the beginning of the Dark Ages.

Suspension of publication is shortsighted because the Medical Society would lose its most effective tool for communication among members, and it is a tool that can well be used to mobilize our profession in fighting for appropriate tort reform and against inappropriate functions of managed care organizations.

The *Journal* seems much more indispensable than the Society's *Bulletin*. Maybe the Society could economize by publishing the *Bulletin* as part of the *Journal*.

John R. Dykers, Jr., MD
P.O. Box 565
Siler City, NC 27344

To the Editor:

I wish to go on record that I do not want to see publication of the *Journal* suspended. The *Journal* places the North Carolina Medical Society in a unique position, not only of having a journal, but an excellent one. Suspension might not be temporary and, at the very least, would disrupt the continuity of the excellent editorial staff.

The reasons for this proposed suspension boil down to money, which seems to be the bottom line for so much in this country.

My personal situation may not be representative of the rank and file of the Medical Society. I am retired because of disability and have no office or patients. The *NCMJ* is about the only medical journal I get; I like the idea of it being addressed to patients as well as doctors. I am proud of it and display it where I can.

Because of my present situation, the top priorities of the Society—managed care and tort reform—important as they may be, are not my top priorities.

Donald C. Schweizer, MD
1009 Bay Head Circle
Wilmington, NC 28405

To the Editor:

Having read carefully the material in the most recent, somewhat truncated, issue of the *North Carolina Medical Journal*, I was appalled to learn that there is serious consideration of its discontinuance in 1999.

Over the past years, I have been increasingly impressed by the quality of the material in the *Journal*, the forum it provides for our members and others, the opportunity for state physicians to gain an audience for their observations and views, and the thoughtful leadership of its editorial staff. The *Journal* also is a source of pride for North Carolina's physicians as it is circulated beyond the boundaries of the state. Letters to the editor attest clearly to its widespread readership. It provides visual evidence to our medical students and residents of the vitality of North Carolina medicine and offers an attraction to their pursuing careers here.

From a fiscal perspective, the Society's $105,000 investment in the *Journal* each year seems modest when contrasted to other expenditures. However, even without any augmentation of revenues, from advertising or other sources, the *Journal* is priceless as a vehicle of continuing education, a forum for debate of relevant medical issues, a source of historical background, and a statement of the Society's commitment to the highest quality of health care in North Carolina.

At a time when too many compromises for costs rather than quality pervade our profession, I implore the Executive Council to withdraw its resolution to suspend publication, and to retain the *Journal* as our most tangible, visible beacon of the Society's quest for excellence.

Samuel L. Katz, MD, DSc
Professor and Chairman Emeritus, Department of Pediatrics
Pediatric Health Policy and Infectious Diseases
Box 2925, Duke University Medical Center
Durham, NC 27710

To the Editor:

I was disheartened to read of the possible "suspension" of the *North Carolina Medical Journal*, especially due to politics, red tape, and lack of appropriated funds.

I often read articles from the *Journal*, as I have the good fortune to be in an office where they get distributed. I find the *Journal* very informative and appreciate the Aphorisms of the Month, which I often hang on my bulletin board.

Please continue this publication!

Jayne Levey, Staff Specialist
Duke University Medical Center
Heart Disease Reversal Clinic
levey001@mc.duke.edu *at Internet*

To the Editor:

Just the thought of the *North Carolina Medical Journal* being discontinued is obscene. For the Executive Council to come up with such an idiotic idea is reprehensible. Why is this journal an absolute necessity? The Council should reflect on the importance of these types of publications.

After World War II, attendance at the national meetings of the American Medical Association waned severely due to the birth of so many specialties. The AMA had to find a way to keep members informed—that being one of the tenets of both the AMA and the state medical societies. Soon, *JAMA*, which had been ho-hum, changed complexion and broadened its horizon. It became more readable, interesting, and kept us informed of what was going on nationally.

At the same time, the NC Medical Society was also experiencing difficulties acquiring members, and attendance at the state meetings was declining for one reason or another. The *NCMJ* had been pretty bland too, but when Dr. Eugene Stead became editor in 1983, he reinvigorated the publication by changing the format and making it more attractive. He also began other publications, like the *Journal*'s Health Watch insert, to keep physicians informed.

We have made similar progress in our local societies. We have expanded our publication, *News of the Greater Greensboro Society of Medicine and the High Point Medical Society*, and we are better informed than ever before. Let's not break our stride. Let's keep publishing the *Journal*.

Robert L. Phillips, MD
1021 E. Wendover Ave.
Greensboro, NC 27405

To the Editor:

I was stunned by the shortsighted resolution of the NCMS Executive Council to suspend publication of the *Journal*. Who are these persons who have fallen prey to the needs of "tort reform and managed care"? Surely our profession has not fallen to those depths.

Part of the tradition and legacy of a noble profession is its literature. I find the *Journal* to be a refreshing, informative, and, at times a provocative publication. It is a vehicle for the open discussion and debate of science, but also for the advocacy of the art of medicine. For those and other reasons I share my copy with our medical students and residents. Clearly, the *Journal* is a credit to our profession. And Lord knows we need that!

I can't believe that, if polled, Medical Society members would support this action. I would urge that a petition or method of proxy be developed for those who are opposed to this action and cannot attend the November 12-15 annual meeting so that their views can be expressed.

I wish the *Journal* continued success with its very worthy efforts.

Robert McLelland, MD, FACR
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UNC School of Medicine
CB# 7510, Fifth flr., Old Infirmary Bldg.
Chapel Hill, NC 27599-7510

To the Editor:

I was greatly upset by the editorials in the September/October *Journal* that indicated that the publication might be stopped. Clinicians and researchers depend on journals like this one for publication. And the fact that the *Journal* sometimes publishes papers written by students is a stimulus to all students in North Carolina's four medical schools.

I sincerely hope the Medical Society will recognize the excellent job the editor and his staff are doing and continue supporting the publication.

George T. Harrell, MD
2701 Pickett Road, Apt. 2050
Durham, NC 27705-5650

To the Editor:

I write to express my strongest support for the *North Carolina Medical Journal*. I believe that the *Journal* serves a number of vital roles in protecting the health of our state's citizens. First, it provides a valuable resource for debate and opinion to North Carolina practitioners, public health workers, and business leaders. Second, it provides an opportunity for physicians-in-training to gain firsthand experience in medical writing. Last, although the scope of the *Journal* is regional, the audience is not. Articles published in our *Journal* are identified across the country, providing an invaluable service both in our state and elsewhere.

As a personal example of how the *Journal* fulfills these important roles, I recently had the opportunity to publish an article in the *NCMJ* assessing the potential health risks posed by North Carolina's hog industry (Fowler VG Jr, Xanthakos S, Corey GR. Of Hogs and Men: Does North Carolina's Hog Industry Raise the Risks of Infectious Disease? NC Med J 1998;59:12-15). Because the topic has great regional importance, the *Journal* was an ideal way to distribute the data to NC clinicians. However, the response we received to this article reflected a geographically and professionally diverse readership. As a direct result of this article, I have been invited to speak at two large symposia on the subject and collaborate in a multicenter grant. It is unlikely that any of these invitations would have occurred had the *North Carolina Medical Journal* not agreed to publish our article.

Based on my experience, the *NCMJ* is the voice of our medical community. Silencing this voice would be a disservice to us all.

Vance G. Fowler, Jr., MD
Division of Infectious Diseases
Box 3824, Duke University Medical Center
Durham, NC 27710

Vintage Folk Medicine Article in New Archive

To the Editor:

Thank you for permission to excerpt from an article by Dr. James Earl Somers, "Folk Medicine in an Isolated Modern Community," (NC Med J 1961;22:611-15). The material will appear in The UCLA Folk Medicine Archive Database and Website, which will consist of about 210,000 records or entries. Our data entry staff is entering into a database program materials collected from books, journals, and other resources that were transposed to index cards, then filed into the UCLA Folk Medicine Archive by folklore and mythology students during the past 45 years.

We want to make the database available on-line through a website, and perhaps publish a CD-ROM of selected portions to libraries, so that it is accessible to researchers, medical personnel, and others concerned with folk medicine.

Michael Owen Jones, Professor
Folklore and Mythology Program and Archives
University of California-Los Angeles
Box 951459
405 Hilgard Ave.
Los Angeles, CA 90095-1459

Religion Elusive in Discourse on Brain and Spirit?

To the Editor:

It has taken me quite a while to sift through the May/June issue on "Brain and Spirit: Coming to Grips with the Intangible." Even then I cannot claim to have assimilated all the articles completely. I write to point out that even though North Carolina is well placed in the Bible Belt, the 8 papers present almost nothing from the Bible's wealth of wisdom on spiritual matters. Maybe the omission was intentional, but I would like to have a little of the Judeo-Christian perspective presented.

The Bible makes us aware that humankind is spirit. We live in bodies and each of us possesses a soul (mind, will, and emotion). The soul is therefore very much involved with the brain, while the spirit involves the heart of a person—not his or her blood pump—but who he or she is. Since we are spirits, each one made by God, the idea of evolution from a lower form of life becomes mute.

In this life we are involved, like it or not, in a struggle between good and evil, God and Satan, angels and demons. This is the invisible spirit world that will become much more clearly seen when our bodies die and we leave those bodies behind. At present, we can learn more about the spirit world from God and the Bible (the safe and recommended way) or from the devil and demons (the dangerous and untrustworthy way).

When we look at the 8 articles through this simplified framework of spiritual discernment, we see some startling revelations. In "Religion and Healing," there is evidence of God's miracle-working power. In the article on Sufism and yoga, we see evil spirits—demons—in their deceitful work. In the paper on hypnosis, I agree with the author that it is a "spiritual gift." But I hasten to point out that it is not the Holy Spirit. People under the influence of demons of hypnosis are not in full control of their faculties as they are when the Holy Spirit is functioning in a person bringing healing, encouragement, faith, and other good things. In Deuteronomy 18:10, Moses states under the anointing of the Holy Spirit that enchangers (hypnotists) shall not be allowed among God's people because (verse 12) "all that do these things are an abomination to the Lord."

People who proclaim a Biblical perspective are called apologists. C. S. Lewis was one of the better known ones, but the Apostle Paul was no doubt the greatest. I am not sure why they are called apologists, because they are not apologizing. People who have participated in the Biblical record or its proclamation however are very uncompromising. Maybe this is where they get the name. And maybe this is the reason behind the omission of precise Christian perspective in much of our deliberation of brain and spirit, since God Himself is very uncompromising in His statements, ideas, and requirements. I was happy that Dr. Mathew included a discussion on Paul's conversion experience because that showed there is hope for all of us to make radical changes in our spirituality.

Marion W. Griffin, MD
218-D Foust St.
Asheboro, NC 27203

Doctors Should Add a Flu Shot to Care Regimen for Diabetics

To the Editor:

People with diabetes are more likely to die from complications of influenza than people without hyperglycemia. From 1985-1987, national surveys on the health and mortality of the US civilian population concluded that people with diabetes are about 3 times more likely than people without diabetes to die from flu and pneumonia-related complications. Each year, 10,000-30,000 people with diabetes die from complications of the flu and pneumonia. During flu epidemics, people with diabetes are 6 times more likely than people without diabetes to be hospitalized, and their death rates may increase 5%-15%. This risk is particularly high when additional risk factors such as cardiovascular and kidney disease are present.

It is estimated that immunization could prevent up to 80% of deaths associated with the flu, yet nearly 2 in 3 adults with diabetes do not get a simple, safe flu shot. Aggressive efforts need to be taken to increase influenza immunization levels among people with diabetes in order to decrease flu-related morbidity and the number of preventable deaths.

Typically, physician-regulated diabetes care emphasizes aggressive control of the disease to retard the onset and progression of long-term complications affecting the eyes, kidneys, and cardiovascular and nervous systems. Concentration may be only on diabetes itself, and not on the overall health of the patient. As a result, we may overlook general preventive measures, such as flu shots, that we would utilize with our patients without diabetes.

The Centers for Disease Control and Prevention launched a national awareness campaign this fall to encourage people with diabetes to get a flu shot before flu season, which is generally November through March. We also recommend a pneumococcal vaccine for people with diabetes. Nationally representative data suggest that less than 1 in 6 persons with diabetes are immunized against pneumococcal pneumonia.

You can help by including influenza and pneumonia vaccinations as part of a regular diabetes management program. Please encourage your patients to be vaccinated to protect themselves from these preventable risks and "take control of their diabetes."

Frank Vinicor, MD, MPH
Director, Division of Diabetes Translation
Centers for Disease Control and Prevention
Atlanta, GA 30333

Harvard Seeks Centenarians for Study

To the Editor:

Boston's Harvard Medical School and Beth Israel Deaconess Medical Center seek participants for a genetic study on aging. Subject candidates are individuals 98 years old and older and their living brothers and sisters who are at least 90. Participants do not have to live in the Boston area. Participation is voluntary and free of charge.

To help us discover information that could lead to a cure for such devastating diseases as Alzheimer's and cancer, please refer us to any of your patients who may qualify. Call us toll-free at 888/333-6327. Thank you for your assistance.

Thomas T. Perls, MD, MPH, Instructor in Medicine
Principal Investigator, The New England Centenarian Study
Harvard Medical School, Division on Aging
643 Huntington Ave.
Boston, MA 02115

Dictum on Dictation Benefits Patients

To the Editor:

Let me tell you how much I enjoyed reading the article "Helping Patients Take Control of Their Medical Records" in the July/August *Journal* (NC Med J 1998;59:251-4). The personal health organizer described helps patients understand their own medical records. Also helpful was the table of various other types of portable patient medical records. The authors identify the need for simple, economical solutions targeted to older patients to help solve the communication crisis in medical information management.

An additional solution for managing patients' medical information is dictating notes in front of patients and then mailing them copies. I have used this method successfully in my practice for the past 25 years. I always send transcribed copies of annual medical reassessments (including a complete problem list) to my patients and agencies, other physicians and relatives involved in their cases. I send copies of additional follow-up medical records of office visits at other times when appropriate.

Dictating in front of patients at the time of their visits, reviewing their cases, and recording their medications disciplines me and enhances understanding, accountability, accuracy, and patient compliance. Medical records are always finished for transcription in a timely fashion. And if the mailed medical record needs any changes, alterations in the official record can be made at the time of the next visit.

Often patients store their records at home and do not have them readily available (in immediate care, in the emergency department, in the dentist's office, etc.). My office has corrected this access problem by attaching a small colored label to the mailed copy. It reads: "Because you are an important person and to improve communications, attached is a copy of your last medical program note by Dr. McCain. Keep it on your person to assure access."

Occasionally, patients carry their medical record with them, but forget to offer it to the receptionist. The receptionists in the hospital emergency department are now beginning to learn to ask my patients for their records, which benefits everyone.

Older patients can have many comorbid complications involving multiple complex medical treatments. In my experience, having the medical record available with the patient reduces cost and time of care, liability exposure (no suits ever filed to date), and improves communication between the patient, family, and other providers—and it improves the care given. Patients appreciate having their medical records. The process helps retain patients, rather than discourage them to leave. It is a good marketing tool.

Thank you for publishing such a good article on improving patient communications and for providing me the opportunity to comment.

John L. McCain, MD, FACR, CMD
2402 Camden St., Suite 700
Wilson, NC 27893-4419

Guidelines for Letters:

Type and double space all letters. If possible, keep length to under 500 words. We welcome longer letters, and we may publish them as commentaries. We reserve the right to edit and abridge text. Send to: *North Carolina Medical Journal*, Box 3910, DUMC, Durham, NC 27710, fax: 919/286-9219, *e-mail:* yohn0001@mc.duke.edu, *Internet:* http://www.ncmedicaljournal.com

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Dear Manuscript Reviewers:

Thanks for Your Two Cents' Worth!

Your reviews of submitted manuscripts enhance our editorial accuracy and integrity and solidify the *Journal*'s status as a peer-reviewed publication. Your remarks primarily assisted our editor render a final decision to accept, revise, or reject papers. In many cases, your input helped our authors become better writers.

You reviewed articles for free, but your efforts were priceless. Some of you simply let us know whether or not you'd read a certain article if we published it; others sent lengthy and quite thoughtful critiques. A few commentaries were so comprehensive that we published them alongside articles as editorial copy.

We salute our 1998 reviewers, listed below, and encourage more *Journal* readers to join their ranks. Just drop us a note, fax, or e-mail with your areas of interest. Agreeing to evaluate a manuscript enables you to give your two cents' worth—and then some—about what we publish in your *Journal*.

Eben Alexander, Jr, MD
George Barrett, MD
Elizabeth Bell, MD
Jerry Bernstein, MD
Robert Bilbro, MD
William B. Blythe, MD
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AIDS and Money

Where Do We Go From Here?

Jeffrey Engel, MD

Almost 30 years ago, the medical school at East Carolina University was created, in part to improve the health of the medically underserved people of eastern North Carolina. There are about 1.2 million people spread over 29 counties here, in one of the poorest regions in the US. There is a very large proportion of minorities, about half of whom live at or below federal poverty levels. There is an excess disease burden, including infant mortality (see page 349), end-stage renal disease, cardiovascular disease, stroke, diabetes, and sexually transmitted diseases. The county health departments, woefully underfunded, do their best to cope with rates of gonorrhea and syphilis that are 10 times higher than the national rate. In this setting of poverty, isolation, and poor health, eastern North Carolina has some of the highest human immunodeficiency virus (HIV) infection rates in the state and the country.

In September 1997, the North Carolina AIDS Drug Assistance Program (ADAP), a state and federally subsidized pharmaceutical program for indigent patients, reached a financial crisis and was closed to new enrollees (North Carolina was one of the first of about 15 states to take this action). This national embarrassment and travesty highlights a failure of health policy in the care of indigents with HIV disease. The NC legislature, in its longest session to date, is still debating a proposed 20-fold increase in state spending for ADAP. In this setting, I want to address the complex funding issues surrounding HIV by providing an historical perspective on the public health policy of a chronic disease that has no precedent: an infection that can be asymptomatic for years, yet be progressive, communicable, and very costly to manage.

A Case in Point

Earlier this year, a 32-year-old African American man from a small eastern NC city was referred to ECU's Infectious Diseases Clinic by the HIV case manager at his county Department of Social Services. He had tested positive for HIV, in a county whose AIDS rate is 35/100,000 (3 times higher then the state rate of 11/100,000 and higher than Wake, Mecklenburg, and Durham counties). The patient was asymptomatic and healthy, but he had diffuse lymphadenopathy.

He had a 9th-grade education, intermittent employment as a laborer, and an unstable housing situation (he lived with his mother at a motel where she was a housekeeper). His well-articulated speech belied his educational background. He denied substance abuse or sexual promiscuity, having had 5 heterosexual partners in his life. He had been treated for gonorrhea 10 years ago. His only risk factor for HIV disease was sexual contact several years earlier with a woman whom he later learned had HIV disease, which prompted his voluntary testing at the health department. I ordered initial staging labs, and sent him to our clinic social worker to enroll him into ECU Care, our indigent care health maintenance organization.

Three weeks later he returned. He wanted to start therapy as soon as possible. Laboratory testing revealed a moderate anemia and leukopenia. The CD4 (T-helper) lymphocyte count was 150 cells per mL of blood, and there were 250,000 RNA copies of HIV per mL of plasma. To my surprise, he had to be classified as having full-blown AIDS based on CD4 lymphopenia and modest bone marrow aplasia. He was a candidate for a highly active antiretroviral regimen. I wanted to avoid zidovudine because of his anemia and leukopenia; stavudine and lamivudine with a protease inhibitor seemed reasonable, with trimethoprim-sulfamethoxazole for *Pneumocystis carinii* pneumonia (PCP) prophylaxis.

I informed the patient that his combined antiretroviral therapy would cost more than $1000 a month. We both smiled outwardly (and sighed inwardly) knowing the huge obstacles that lay ahead. My patient and I then began the most time-consuming and frustrating aspects of health care delivery for HIV infected people in the US: getting medications. I sent him to our clinic pharmacy, which has a very limited formulary of generic drugs, to at least get PCP prophylaxis started. I told him to see the case worker at the county Department of Social Services as soon as possible to apply for disability and Medicaid. The State ADAP program was by this time no longer

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accepting new applications. As a drug-naive patient, he was ideal for enrollment into a clinical trial, but we have only one small trial at ECU, and it was closed to new enrollees. I sent him back to our social worker to begin applying for his final option: pharmaceutical company indigent care programs.

Because we wanted to avoid zidovudine, I could not use the easiest (relatively speaking) solution: one application to GlaxoWellcome for zidovudine/lamivudine (Combivir) and one application to Agouron for nelfinavir. Instead, I needed to fill out the GlaxoWellcome form for lamivudine, the Agouron form for nelfinavir, and an additional form from Bristol Meyers Squibb for stavudine. Trying to synchronize applications to 3 different companies so that my patient could start 3 medications simultaneously was an administrative nightmare. Not only that but I needed to apply again for refills in 4 months to Agouron, and in 6 months to Bristol Meyers Squibb, and so on. Multiply this process by several hundred patients and you can begin to see how this uncompensated activity can rapidly gobble up resources.

A Brief History of AIDS and Health Policy

Funds for AIDS care come from 5 basic sources: 1) private insurance, 2) research dollars, primarily from the National Institutes of Health (NIH) and pharmaceutical companies, 3) entitlements administered through the Health Care Financing Administration (HCFA) such as Medicaid and Medicare, 4) exceptional programs such as ADAP and the Ryan White Comprehensive AIDS Resources Emergency (CARE) Act, and 5) pharmaceutical company indigent care programs. I will not discuss the first 2 options in detail because only a tiny minority of my patients have private insurance, and ECU has few research dollars at this time. Suffice it to say that the NIH has funded many AIDS Clinical Trial Units (ACTU) since the mid-1980s, and our state has benefited greatly from these programs. These clinical trials often function as *de facto* indigent care programs, an ethical issue that researchers must deal with because the availability of drugs may coerce poor subjects into these studies.

Next are the entitlements. For the AIDS population this means Medicaid, the federal- and state-funded insurance program for the poor and medically disabled. Different states administer their Medicaid programs differently. Except in the case of pregnant women and children, NC Medicaid controls its enrollment by financial and medical criteria (limited household income and the presence of a disabling medical condition). The NC legislature recently expanded Medicaid to cover children in low- to middle-income families through CHIP (Children's Health Insurance Program), but at present it is impossible to get an able-bodied adult into NC Medicaid. Most of my patients are denied Medicaid if they fail to qualify for disability benefits from the Social Security Administration. The diagnosis of AIDS is not enough; one must be sick with AIDS to be covered. This differs from the early 1990s when a CD4 count of less than 200 alone was enough to qualify. Now it takes a disabling opportunistic infection, dementia, or cancer. New eligibility requirements may have allowed NC Medicaid to cut the costs of its program. As NC Secretary of Health H. David Bruton, MD, wrote when he took office, "One of my main tasks will be to limit the annual growth of Medicaid spending to 8% by the year 2001."[1]

Even when insured under NC Medicaid, continuous coverage is not guaranteed. Every 6 months, the state reviews the client's financial situation. If household income exceeds a threshold, then a deductible (the "spend down") must be met before the insurance will be resumed. The client must spend income down to the threshold in order to regain Medicaid benefits. How is it possible for an indigent person to exceed the threshold income and enter a spend down? It happens whenever a client's Supplemental Security Income exceeds the NC Medicaid threshold. Spend downs lead physicians to use bizarre gaming practices to maintain their patients' Medicaid. If a patient is facing a $2000 spend down, a physician can order $2000 worth of unnecessary tests, knowing that the patient cannot pay. The patient then presents the medical bills in order to have Medicaid reinstated. This gaming is ostensibly on behalf of patients, but is not a good way to approach Medicaid spend downs; it is inherently unfair to a program that serves many people in the state. To again quote Secretary Bruton, "significant savings can be realized if physicians better manage the care of their Medicaid patients."[1] To address gaming and other inefficiencies in the system, NC Medicaid has piloted a managed care program with my physician-hospital organization in Pitt County this year. Eventually, we hope to enter into risk-sharing agreements with Medicaid for total HIV care. If nothing else, it should eliminate Medicaid spend downs.

Currently, the HIV-infected patient in a spend down faces a very real possibility that medications will be interrupted for several months. This is unacceptable since resistance to antiretroviral drugs can develop in a matter of weeks. The safety net under those circumstances has been to apply for pharmaceutical company indigent care programs. Even this may disappear, however. Bristol Meyers Squibb announced recently that it will no longer approve applications for people on Medicaid spend downs.

Circumventing Medicaid

The problem faced by low income people with chronic diseases who cannot meet entitlement program requirements has led to another federally funded health care delivery system in the US known as "exceptionalism." The first example of economic exceptionalism was the End Stage Renal Disease (ESRD) program, which gave a large group of "exceptional" patients access to Medicare benefits in 1972. The argument for the ESRD program was that special populations with special needs deserve special consideration.[2] Expensive dialysis treatments that could prolong life for decades were the impetus for this program. In 1987, after zidovudine was approved for use in HIV disease, the first AIDS exceptional program came into existence as the AIDS Drug Assistance Program.[2] Originally funded by the federal government and Burroughs Wellcome, ADAP provided zidovudine to those who lacked adequate insurance coverage. ADAP also was a response to the loud protests and civil disobedience of predominantly gay-oriented AIDS advocacy groups. AIDS exceptionalism was unique because it began with patient advocacy rather than physician advocacy.[2]

I was encouraged by the physician advocacy for HIV-infected people that was demonstrated after the NC ADAP program closed in 1997. A tremendous lobbying effort, primarily by physicians, resulted in a $16 million ADAP funding proposal being submitted to the state legislature for fiscal year 1998-1999. This represents a more than a 20-fold increase in support over the $750,000 funded in 1996 and 1997. Sadly, though, my patients are not organized to advocate for themselves like the gay community was early in the AIDS epidemic. My patients are disenfranchised from mainstream society. They are rejected by their communities and churches. They are overburdened with the chaos of poverty, racism, and ignorance, let alone their overriding desire for privacy.

Since 1987, each state has decided on its ADAP formulary of covered medications, established a set of eligibility criteria, and determined its own fiscal contribution to the program.[2] In 1990, Congress passed the Ryan White CARE Act, which soon became the main source of federal funds for state ADAPs. Ryan White CARE funds are administered through the Health Resource and Service Administration (HRSA) of the US Department of Health and Human Services (HHS); Title I funds are earmarked for large cities and Title II funds for states. In 1997, state contributions for their ADAPs ranged from 0% (in many states) to 83% (in Louisiana); North Carolina funded 20% of its ADAP program.

In 1995, the availability of protease inhibitors to control HIV put enormous financial demands on ADAPs. In 1996, the International AIDS Society and HHS made triple combination therapy the standard of care (talk about unfunded mandates!), thereby increasing the cost of treatment by as much as 400%.[2] In September 1997, North Carolina's ADAP became one of the first to close, due in part to the rapid statewide dissemination of practice guidelines. This experience highlights ADAPs' major weakness: they are financially fragile because of the rapidly increasing costs of antiretrovirals and the fact that the CARE Act that funds them is not supported by an entitlement.[2]

The other weakness of AIDS exceptionalism is that special funding for AIDS is unjust. The claim is made, and I think rightly so, that "persons in a society have the right to just allocation of that society's resources."[2] Therefore, "one must demonstrate that persons with AIDS have a greater claim on society's resources than do persons with other diseases. This injustice may threaten the achievements that exceptionalism has won. When exceptionalism leads to an unjust allocation of resources, it must face challenges from persons with other health care needs. In the long run, exceptionalism will not withstand these challenges and a fundamental reconsideration of exceptionalism will be necessary."[2]

Where Are We Going?

At least 3 federal agencies fund AIDS care: the NIH through the ACTUs, HCFA through Medicaid, and HRSA through the Ryan White CARE Act. It is my belief that fragmented funding leads to fragmented programming and inefficient care for indigent HIV-infected persons. Our challenge as a society is to develop an affordable system that cares for all of its members no matter what diseases they have, a system of entitlements like those afforded to persons with end-stage renal disease.

Pharmaceutical companies have helped patients get medication. Certainly, private industry has avoided exceptionalism in administering indigent care programs for many expensive medications (for example, interferon for chronic hepatitis, erythropoietin for certain anemias, and colony-stimulating factors for cancer patients with neutropenia). My only objection is that private pharmaceutical companies should not be in the business of social work. It bothers me greatly that someone at GlaxoWellcome or Bristol Meyers Squibb or Agouron knows my patient's business.

Another issue is the cost of treatment. Every new generation of antibiotic, antihypertensive, or antiretroviral drugs seems to come at a disproportionate increase in price. What is a fair price for a protease inhibitor that a patient may need for a lifetime? What should be the lifetime cost of all antiretroviral therapy? Should it be the same as dialysis for end-stage renal disease? Why not? Maybe we need to come up with a relative value scheme for lifesaving treatments of chronic diseases, upon which fair pricing could be based.

Our system of health care delivery needs an overhaul, and HIV patients may get a boost from an unexpected side: the judicial system. On March 30, 1998, the US Supreme Court heard the case of Bragdon v Abbott,[3,4] in which a dentist (Bragdon) refused to treat the tooth of an HIV-infected woman (Abbott). The patient alleged that the refusal violated the Americans with Disabilities Act (ADA) of 1990. Among other claims, the dentist argued that the patient, who was not symptomatic, had no disability under ADA. To fall under ADA, an impairment (in this case, asymptomatic HIV infection) must also interfere with a person's ability to perform a major life activity. The patient claimed that her infection had resulted in a decision to avoid pregnancy, thus substantially limiting the major life activity of reproduction.[4] On June 25, the Supreme Court ruled in favor of the patient concluding that reproduction is a major life activity, and that an asymptomatic HIV infection qualifies as a disability under ADA.[3]

The Court's decision may have far-reaching implications for Medicaid eligibility. Of course disability under ADA is not the same as disability under Social Security, which pertains mainly to the ability to be gainfully employed. However, it may be argued that since the Supreme Court ruling in Bragdon v

Abbott protects asymptomatic HIV-infected people under ADA, they should also be protected from advancement to AIDS. Hence, this court decision may sway health policy makers to extend Medicaid coverage to adults with chronic diseases who are not ill but who do meet some qualifications for disability.

The Lesson From My Patient

Back to my patient with newly diagnosed asymptomatic AIDS. After 3 months, he still was not on any antiretroviral therapy, his disability claim had been denied, and he had been turned down for Medicaid. He remains on trimethoprim-sulfamethoxazole, and is receiving his antiretroviral medications through the indigent care programs of GlaxoWellcome, Bristol Meyers Squibb, and Agouron.

The funding issues behind indigent care are obviously complex, but society must guide its health policy toward the efficient use of limited resources. I believe that ADAP will fail as a social policy because of its funding weaknesses and its basic unfairness. Congress should map out a strategic plan that combines funds from HRSA and the Ryan White CARE Act, HCFA and Medicaid, and the NIH and ACTUs into a comprehensive, integrated system to care for HIV-infected people. The proper treatment of asymptomatic HIV disease will enable patients to work as productive citizens for perhaps decades. As they return to health and productivity, patients should not have their health coverage threatened by unreasonable income thresholds. In addition, pharmaceutical companies should be required to negotiate discount prices on the drugs used by entitlement programs, thus eliminating the need for the costly administrative overhead of their indigent care programs.

For the short term, we, the physicians caring for HIV-infected patients, must continue to be advocates for these people. We must support the funding of NC ADAP, but ultimately we must all work diligently for a fair and just health care system in our state and country—one that treats all people with illness and disease equally. ❑

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What Can Be Done About Infant Mortality in Pitt County?

Janice K. Fisher, MD

Infant mortality, a major indicator of health in developed nations, has been the focus of national, state, and local attention during the past decade. In 1996, US infant mortality reached a record low 7.2 deaths per 1000 live births.[1] That year, North Carolina ranked 46 out of 50 states in infant mortality, or fifth worst in the nation. Despite our low ranking, North Carolina has shown steady improvement over the past several years, and infant mortality statewide has been at its lowest level in history for the second consecutive year.

Although the nation and the state have shown improvement, infants still die in Pitt County at almost twice the rate of the rest of the state.[2,3] Why has infant mortality remained so high in Pitt County? Perhaps health care providers and the communities they serve are not doing enough, or they are not doing it right. How can providers of comprehensive prenatal care work toward a solution?

Infant Mortality in Pitt County

In July 1997, an article in *The Daily Reflector* alerted Pitt County residents to a dramatic rise in infant mortality in the county, from 10.6 deaths/1000 live births in 1995 to 16.6 in 1996. The data for African-American babies were even worse—up from 17.3 in 1995 to 26.7 in 1996.[4] Table 1, at right, displays local, state, and national neonatal and infant mortality averages from 1989-1993.[2] Infant mortality rose and fell in Pitt County during the 1990s, while statewide statistics remained steady or decreased (Figure 1, next page). Even more dramatic are the trends in white and nonwhite (largely African-American) infant mortality rates in Pitt County.

Pitt County has a number of programs aimed at reducing infant mortality and the disparity between white and African-American deaths. Many people assume that just decreasing teen pregnancy rates would lower infant mortality. However, infant deaths nationwide, as well as in Pitt County, are not disproportionately attributed to young teenagers. A study at the University of Texas-Galveston found that the rates of preterm labor, cephalopelvic disproportion, infection, and premature rupture of membranes in girls younger than age 15 were similar to those in young women age 16-22.[5] These two groups had similar rates of low birth weight and very low birth weight infants, and fetal deaths. Data from Pitt County in the early 1990s echo these findings: Only 10% of infant deaths from 1986 to 1989 occurred in children born to mothers younger than age 18.[2] Teen pregnancy is a major social issue, but it is not the major contributor to infant mortality.

During the first half of this century, US infant mortality declined dramatically, largely due to a reduction in deaths in the postnatal (age 2-11 months) period. Since 1950, most infant deaths have occurred in neonates (aged <1 month), but since 1981 the rate of decline in infant deaths has slowed[6] because of a lack of progress in reducing the number of low birth weight (LBW: <2500 g) and very low birth weight (VLBW: <1500 g)

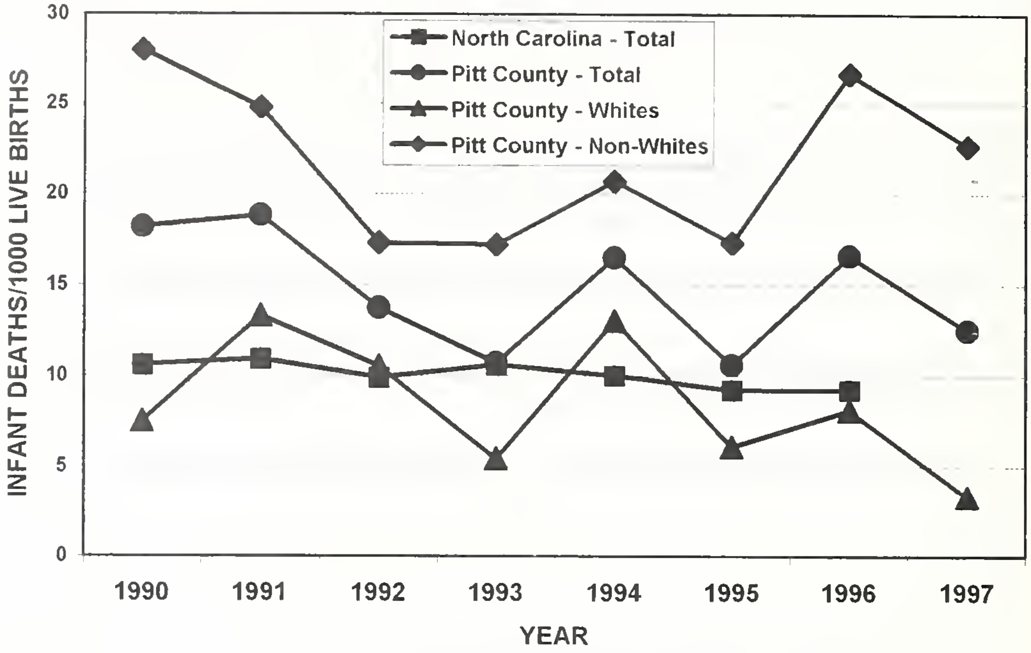
Table 1. Neonatal and infant* deaths per 1000 live births 1989-1993.[2]

	US	NC	Pitt
Total—Neonatal	6	7.3	11.4
Total—Infant	9.5	10.7	15.4
White—Neonatal	5	5.2	5.9
White—Infant	7.9	8	8.9
Black—Neonatal	9.7	11.6	17.8
Black—Infant	15.2	16.4	22.8

*Neonatal: <28 days of age; infant: <1 year of age (neonatal and post-neonatal deaths)

Dr. Fisher wrote this piece after completing a community medicine rotation during her residency at East Carolina University School of Medicine, Greenville. She now practices family medicine at Oak Island Medical Center.

infants.[6] African-American mothers are two times more likely than white mothers to deliver LBW infants and three times more likely to delivery VLBW infants.[6] Furthermore, African-American infants of appropriate birth weight are twice as likely to die as white infants because of higher rates of infection, injury, and sudden infant death syndrome (SIDS) in the African-American population.[7] Poverty, limited access to adequate prenatal care, and poor nutrition probably all contribute to higher LBW and mortality rates in African-American infants. Factors like smoking, drug and alcohol use, and lack of early or adequate prenatal care influence birth outcomes, regardless of race. Without adequate prenatal care, these factors cannot be identified and possibly modified.[2]


INFANT MORTALITY RATES IN NORTH CAROLINA AND PITT COUNTY

The factors that increase the risk of delivering an LBW infant are well documented (Table 2, at right).[5] We know that 72% of infant deaths in Pitt County in 1991 were associated with LBW, prematurity, or both. A preliminary review of 1997 data for Pitt County shows that extreme prematurity caused 14 of the 22 infant deaths.[8] The costs of caring for just one premature or LBW infant equal those of 22 term births: $14,000 - $150,000 versus $4,300 for an infant at term.[2] Not only do infant deaths represent an unacceptable human cost, they also represent an avoidable financial burden.

Table 2. Risk factors for delivery of low birth weight infants[5]

Health factors	Other factors
Smoking	Unwed mothers
Alcohol use	Low education*
Substance abuse	Low economic status
Inadequate nutrition	Minority status
Emotional stress	Age <17 or >35
Late prenatal care†	
No prenatal care	

*Education less than grade 12
†Care initiated after the first trimester

Barriers to Care

From 1969 to 1980, women who began prenatal care in the first trimester had improved birth outcomes.[9] Since 1980, however, more women have been getting late (after the first trimester) or no prenatal care. In 1985, nearly 8% of pregnant women nationwide received inadequate or no prenatal care,[9] but in Pitt County an estimated 25% of women receive late or no prenatal care.[2] What accounts for the smaller numbers of women seeking adequate care? In 1986 the Institute of Medicine formed the Committee to Study Outreach for Prenatal Care (CSOPC) to find ways to enroll women earlier and to maintain them in prenatal care. Several demographic risk factors were identified[9] as being associated with inadequate prenatal care:

1) **Age**: Mothers <15 or >40 years of age are more likely to receive late or no prenatal care.
2) **Minority status**: African-Americans are twice as likely as whites to receive no prenatal care.
3) **Education**: Nearly 90% of college-educated women initiate prenatal care in the first trimester, but nearly 60% of all pregnant women have less than a high school education.
4) **Birth order**: The more children a woman has had, the less likely she is to seek sufficient prenatal care.
5) **Marital status**: Unwed mothers are three times less likely than married women to receive adequate prenatal care.
6) **Income**: Poverty strongly correlates with late or no prenatal care. One-third of all births are to women at or below 150% of the poverty level.
7) **Geography**: Inner city and rural women are less likely to receive adequate care.

CSOPC identified 4 major barriers to prenatal care: financial, system capacity, prenatal services, and cultural or personal factors.[8] Focus groups conducted in Pitt County found similar barriers to care[1]:

1) **Financial**: Women on Medicaid are less likely to seek early care than the privately insured, despite increased access to Medicaid services.
2) **System capacity**: Too few doctors accept Medicaid; low-income women, and many areas of the state, have no obstetrical providers.
3) **Poor prenatal services**: Services are often fragmented and inadequately coordinated. Lack of transportation or child care, inconvenient service hours, long waits, language and cultural barriers, unpleasant clinics and health care providers, and lack of information about existing services impairs access.
4) **Cultural/personal**: Attitudes toward pregnancy influence efforts to obtain prenatal care. More than half of all pregnancies in the US are unplanned. Some cultures view pregnancy as a healthy condition not requiring the care of a physician. Many women fear or dislike their health care providers, or the provider's reaction to personal habits such as the use of drugs, alcohol, and tobacco. Previous bad experiences with prenatal care, and stress, depression, and denial during pregnancy, can all influence women not to seek early care.

The CSOPC reviewed 30 programs nationwide that sought to reduce infant mortality by addressing barriers to care. One disturbing conclusion was that most programs lacked the money and personnel even to evaluate whether their interventions were effective. Still, the committee recommended that elimination of barriers to care remain the focus of further interventions, along with efforts to coordinate community-wide action. Increased awareness of the resources available was felt to be a key to future successes.

The Effort in Pitt County

For more than half a decade, health care and community leaders in Pitt County have been trying to enhance and better coordinate prenatal services in order to lower infant mortality. The Pitt County Health Department provides basic prenatal care services and also offers risk assessment and referral services to the low-income population. Nutritional and mental health counseling, prenatal education, and childbirth classes are open to all women in Pitt County. East Carolina University's School of Medicine provides a full spectrum of prenatal care services for low- and high-risk pregnancies through the Department of Family Medicine and the Department of Obstetrics and Gynecology.

Baby Love, a 3-component program unique to North Carolina, is administered through public health departments throughout the state. Perhaps the most remarkable aspect of Baby Love is Maternity Care Coordination. This service is available to all pregnant women in Pitt County, regardless of income. It provides special services such as transportation assistance, child care, home health visits, and psychosocial counseling for women with high-risk pregnancies.

The federal Women, Infants, and Children (WIC) program provides low-income women with nutritional services, including food vouchers and nutritional education for mothers and babies. Medicaid counseling is provided to help with the application and renewal process.

The Pitt Infant Mortality Prevention Advisory Council (PIMPAC) was formed in 1990 through a grant from the Kate B. Reynolds Health Care Trust to the Pitt County Health Department.[10] Its members include local public health workers, social workers, prenatal care providers, community volunteers, church leaders, and members of civic organizations. During its first two years, PIMPAC assessed the problems relevant to Pitt County using focus groups comprised of health care providers, community leaders, council members, women who had received early prenatal care, and those who had received late or inadequate prenatal care.[11,12] PIMPAC conducted case-matched interviews with women who had had good or poor prenatal outcomes during a 2 1/2-year period.[11,12] These studies showed that problems in Pitt County mirrored those in the nation: lack of transportation and child care, lack of education, unplanned pregnancies, unwed mothers, and cigarette smoking. African-American death rates far exceed white death rates (Figure 1). PIMPAC discovered that 90% of infants who died were born to mothers older than age 18, and that most were not products of a first pregnancy.[2] Based on these findings, PIMPAC undertook a number of initiatives including funding for transportation, child care services, and interpreters; providing incentives for prenatal care participation; and improving services for low-income populations.

PIMPAC realized early on that to make headway against infant mortality in Pitt County, it had to address the disparity in white and African-American infant mortality rates. PIMPAC's funding expired in 1995, but the council was reenergized through a grant from the North Carolina Department of the Environment, Health, and Natural Resources to the Pitt County Health Department.[1] As a result, PIMPAC was able to participate in the Minority Infant Mortality Reduction Project (MIMRP), a statewide program aimed at reducing infant mortality in the African-American population. Using PIMPAC and state resources, MIMRP has worked to reduce infant mortality in Pitt County's African-American women, especially those 20-29 years old, by identifying culture-specific barriers to care and developing culturally sensitive strategies for raising public awareness about infant mortality. In addition, the Resource Mom program was developed as an outreach of MIMRP. Resource Moms serve as points of contact for African-American women at risk for poor pregnancy outcomes. These contacts provide prenatal education and information during pregnancy, as well as social and educational support after delivery in hopes of delaying the next pregnancy for at least one year.

The Adolescent Pregnancy Prevention Council (APPC) is made up of local public health leaders and health care providers who have undertaken the task of reducing teen pregnancy rates in the county.[13] In 1993, 295 of 1700 live births in Pitt County were to women younger than 19 years old.[2] In North Carolina, teens who give birth before age 18 are highly likely to have a second pregnancy before age 20.[2] The Council coordinates countywide efforts aimed at the primary prevention of pregnancy and the delay of subsequent pregnancies.

In 1997, a 7-county coalition in eastern North Carolina, led by Pitt County, was awarded a 4-year federal Healthy Start Grant. After reviewing infant mortality statistics statewide, the State of North Carolina applied for the grant on behalf of Pitt, Tyrrell, Martin, Washington, Edgecombe, Bertie, and Greene counties.[14] The grant proposal seeks to reduce infant mortality by innovating existing services, improving coordination of services, and improving case-finding capabilities. Interestingly, the grant stipulates that half the coalition members be consumers of prenatal services. This requirement underscores the necessity of involving the public in raising awareness of the problem as well as in searching for solutions.

What Remains To Be Done?

In spite of expanding prenatal services and efforts to reduce infant mortality in Pitt County, the problem of high infant mortality has remained essentially unchanged for a decade. Why, with all of the programs and interest, do our infants continue die? The answer is not clear. Regardless of a woman's age, the prevention of unwanted and unplanned pregnancies must receive further attention. We need studies of prenatal care providers, both health systems and individuals, to assess their attitudes toward prenatal care, and their knowledge of the impact of that care and the availability of community resources. Improving the quality of existing services and the coordination between agencies and individual practices must continue. We must strive to reduce financial barriers to care, and find innovative ways to encourage patients' participation in early and adequate prenatal care. The practices and policies that shape prenatal care begin with attention to every individual's own practice. We need increased public and private awareness of the problems and the services available to help them. Perhaps the problem of infant mortality can be best addressed through improved communication and cooperation among health care providers and the communities they serve. Dr. Tim Monroe, former director of the Pitt County Health Department, sounded the alarm in 1993:

> "Pitt County's high infant mortality rate does not reflect our medical care facilities—it reflects our community's value system and our level of social injustice. Infant mortality is not a medical problem—it is a socioeconomic problem. Government and the private sector have a responsibility to jointly explore the health of our children and their families. The extent to which we assure their health and safety reflects our priorities."[2]

Efforts to decrease infant mortality must begin with improved services to our own patients and with identification of problems within our own patient population. As physicians, we owe our patients the best care available. We also have a responsibility to our communities to become part of the solution. ❑

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The Woman Who Cried Wolf

Leonard Ferenz, PhD, and John Lincourt, PhD

We want to tell you the story of Blanche Dewolfe,* a 350+-pound, 69-year-old, disabled woman who has diabetes and who lives alone. And we want to tell you about a new organization designed to improve access to health care by coordinating health agencies in a predominantly rural North Carolina county. Cases like Ms. Dewolfe's are not uncommon; they pose ethical challenges to health agencies, professionals, and ad hoc groups that try to manage the care of noncompliant patients with genuine (and some not-so-genuine) medical needs.

Ms. Dewolfe's physical disability and poor health make her physically and economically dependent on both formal and informal support services. She has a documented history of noncompliance. There are questions about her competence. She is poor. Her physician and various state and county agencies involved in her care believe that Ms. D's situation is life-threatening. Our concerns in this case center around two questions: 1) Do the special features of rural health delivery help or hinder in a managed care environment? 2) How can we manage cases like the Ms. D's in a rural setting?

Not much literature addresses the ethical problems of rural medicine. This suggests that both providers and commentators believe that issues of rural medicine can be treated merely by extending the medical policies and practices developed for urban areas. Urban and rural health care are perceived as parts of a seamless whole, uniform in nature and function. We believe a discussion of Ms. D's case will illustrate some weaknesses in this view.

The Saga of Blanche Dewolfe

On Ms. Dewolfe's frequent visits to the hospital or during home health visits, health professionals have noted the following health problems:

- Morbid obesity
- Immobility (bedridden)
- Insulin-requiring diabetes
- Hypertension
- Congestive heart failure
- Chronic obstructive pulmonary disease
- Bilateral club feet
- Edema/recurrent leg cellulitis
- Chronic leg pain
- Poor eyesight
- Incontinence (intermittent with diapers)
- Gastroesophageal reflux
- Polypharmacy (up to 19 medications daily)

Ms. Dewolfe's care is labor- and resource-intensive. Her medical needs and out-of-facility living require almost daily visits by assorted health care providers, as well as frequent visits to the hospital and doctor's office. Perhaps, most telling, is the patient's use of ancillary services. During a recent 9-month period her health care services included

- 2 physician consultations (pulmonary and psychiatric)
- 4 treatment plans
- 12 skilled nurse visits
- 25 medical social services follow-up visits
- 54 telephone calls (13 from the patient)
- 168 personal home care calls
- recertification updates, case conferences, reports, etc.

The case came into focus because of the patient's abuse of Emergency Medical Services (31 calls to 911 in a 2-month period). Emergency response personnel often found that her "emergencies" consisted, for example, of needing help getting into bed, or having her legs lifted into bed for her, or emptying her bedside commode, or adjusting her room temperature, or making her a sandwich. The patient was counseled by EMS responders, home health aids, and social workers about the abuse of 911 calls. Still, the situation persisted, so the home health agency responsible for her in-home care called a special meeting of its ethics committee. Representatives from various agencies, including Social Services and EMS, were present.

Dr. Ferenz is Faculty Associate and Dr. Lincourt is Director, Center for Professional and Applied Ethics, UNC-Charlotte, 9201 University City Blvd., Charlotte 28223. *Not her real name.

One fact quickly became clear to all: Ms. D was lovely and sweet—and very manipulative. Nearly all members of the professional community who came in contact with her found themselves doing things for her that were beyond the scope of professional obligation. A county employee revealed that he stopped by a local discount store to purchase diet sodas and snacks, which he delivered with Mrs. D's weekly personal needs allowance. Home health nurses complied with Ms. D's requests to empty her trash, make sandwiches, and arrange furniture. Those present at the meeting realized that in exceeding their professional obligations, they had enabled Ms. D to live alone in a dangerous, even life-threatening, situation. The fact that her living arrangements are unsafe had been established several months earlier. At that time, Ms. D was withdrawn from a community assistance program because Social Services reviewers determined that Ms. D's general disability and her need for an oversize wheelchair that would not fit through the entrance doorways to her home would prevent her escape in case of fire or other serious calamity.

The home health agency hosting the meeting considered notifying Ms. D of its intent to discontinue service to her because institutional policy required the agency to discontinue care whenever it could not ensure the health and safety of the client. The situation reached a climax when some 20 people (social workers, nurses, nurses aids, administrators, county officials, EMS personnel, and an ethicist) confronted Ms. D with the history of her noncompliance and her abuse of 911 and other service providers. Ms. D, touched deeply by the concerns of the group, agreed to cooperate and to consider moving to a long-term care facility.

In the following months, Ms. D's compliance improved dramatically, and no calls were made to 911. However, matters became complicated when the patient's physician decided to relocate and none of his associates would assume her care. The physician's orders for home care would soon expire and no progress had been made to place Ms. D in a nursing home. The home health agency considered it imperative to find Ms. D a new physician, or place her in a nursing home, or notify her of their intent to discharge her.

As the date of reckoning drew near, a young physician, newly arrived in the county, agreed to accept her as a patient. At another meeting hosted by the home health agency, he expressed his deep concern about her safety, especially when a social worker informed the committee that Ms. D's trash can had caught fire the previous week and had burned part of her back porch. The fire apparently extinguished itself, but Ms. D had been unaware of the danger until notified by a neighbor later in the day.

A continuing problem was that social workers were unable to find her a bed in a nursing home. They were told "off the record" that a bed could probably be arranged if Ms. D required skilled care, but her evaluation indicated only a need for intermediate care. In addition, nursing home representatives were concerned about several things: possible injuries to staff and the patient while trying to move Ms. D, and the problems of obtaining worker's compensation in the event of such injuries; the general difficulties providing adequate care, including avoiding skin breakdown; and the expense of a Hoyer lift needed to move a patient of her size.

The County Health Alliance

Ms. D's rural county has a new Health Alliance that offers hope of a better solution in cases like hers. The Alliance is made up of administrators, managers of health services, EMS personnel, home health nurses, and personnel from rural hospitals and agencies involved in rural health care delivery. The Alliance was created to provide access to care by identifying and coordinating the resources of various health care providers in the area. According to its mission statement, the Alliance's goal is "Achieving the highest level of individual and community health through collaborative action." Our hope is that the Alliance will be able to find Ms. D a bed in a nursing home through collaborative action. One helpful sign is that members of the Alliance learned about some of the tensions between urban and rural pressures that bear on the case.

The Virtues—and Vices—of Rural Medicine

Rural medicine possesses distinct values—both positive and negative. Granting some overlap with the values of urban medicine, rural practitioners face a different set of challenges. Possibly the most distinguishing feature is that rural practitioners often view patients as extended family members. Rural physicians make house calls and participate in more visible ways in community life. Rural communities portray themselves as more friendly, informal, and caring. There is a greater likelihood that health professionals will know a given patient or patient's family. Blanche Dewolfe's case provides ample evidence that neighborliness and amiability continue to be valued in a rural setting.

There also appear to be certain drawbacks to rural medicine. Practitioners are less medically sophisticated, and more resistant to innovation and change. There is more illiteracy, fewer medical services and specialties, and a pervasive belief that difficult cases can always be transferred to an urban medical network. Ironically, this sometimes leads to a "Big Brother" mentality so that rural practitioners become defensive and try to compete with larger urban facilities. Professionals and nonprofessionals alike tend to expect more from the rural health care system than it can and should legitimately provide. Since rural medical resources are not extensive or advanced, many health care needs go unmet.

Another problem arises from the well-meaning desire of rural providers to place a high priority on patient preferences. A respect for the preferences and desires of patients would normally be considered a virtue, but the restrictions of managed care operate in the rural setting. The direct and indirect costs (in money, resources, time, and opportunities) of trying to maintain patients in their preferred living arrangements can be problematic. Ms. Dewolfe, for example, wanted to remain in her home. Setting aside the question of safety, it is not clear whether it would cost more or less for her to live at home or in a nursing home. But just as in big cities, costs of rural health care increase when the number of treatment and management options available to patients goes up. This often means the subordination of patient preferences to cost considerations.

Ms. D's case illustrates the special problems of noncompliance in rural settings where there is significantly less anonymity and confidentiality than in urban areas. People tend to know one another and curiosity (sometimes, nosiness) runs high. In effect, there is greater visibility and awareness of every individual's personal situation. In Ms. D's case, nearly every health care agency in the county knew about her numerous calls for assistance in nonemergent situations. She had a reputation as a difficult and noncompliant patient, and this may have contributed to the difficulty in finding her a bed in a nursing home. As one EMS technician said, the many times Ms. D "cried 'Wolf!' came back to bite her."

Even with all the difficulties of management and placement, the rural strategy may still be the most effective way to manage cases like Ms. D's. She is perceived by local health care workers as a neighbor and extended family member, so that the care plan and level of patient satisfaction achieved a kind of equilibrium. In less hospitable settings, Ms. D would more than likely have fallen between the cracks in the system.

It would be a mistake for rural health systems to depend on health care strategies developed from statistical analysis of large urban populations while neglecting the case-specific issues of rural medicine. It would be a mistake to assume that the needs of rural residents can be met adequately through mechanisms designed to serve larger population groups, although when such deficiencies occur, they are seen as problems of implementation not of urban bias. The needs of persons like Ms. Dewolfe are conditioned to some extent by rural values and the culture in which the providers and services are located. Moreover, morbidly obese persons like Ms. D are underrepresented in the design of health services in rural areas, so not one of the six nursing homes in her community has the equipment needed to manage patients of her size. Cases like Ms. Dewolfe's therefore cannot be handled in a rural setting the same way that they would be in an urban setting. This is the rationale behind the Alliance, which can serve as a clearinghouse for special equipment requests and recommend the most suitable location to house onetime purchase items, like a Hoyer lift.

Concluding Remarks

Health care providers need to honestly appraise rural medicine's capacity to manage difficult cases like Ms. Dewolfe's. If plans for treating such patients are insufficient, unworkable, or fail for systemic reasons, other options should be sought. One strategy might be to establish reciprocal arrangements between rural and urban facilities. Since patients are routinely referred to urban settings for highly specialized care like cardiac catheterization, the transfer of patients like Ms. D might be part of a larger systemic care plan. Rural providers must be careful not to force a fit, though, because urban models of managed care and statistical analysis of population needs may not be appropriate. After all, the rural setting is precisely what draws caregivers and patients anxious to escape the anonymity and management mentality of urban medicine. But there are times when referral to the urban setting may be the most appropriate choice.

Our story of Blanche Dewolfe and the County Health Alliance is not over. Ms. D's case was presented at the Alliance's recent meeting. In hearing the case, the Alliance demonstrated its willingness to consider the specific needs of a single individual. To their credit, the Alliance decided to inquire into the policies governing the admission of obese patients to nursing homes. At present, Ms. Dewolfe still has not been placed in an intermediate care facility. The official reason is the high cost of purchasing and installing a Hoyer lift needed to care for obese patients. ❑

"YES!"

by Dorothy M. Sutton

To answer a certain need
For scientific facts indeed
So I joined the group and became a part
Of how this study would affect the heart.
Five years of visits to help meet the task:
Physicians and tests and questions asked.
Of traded bottles that contained the pill
Possibly placebo, or possibly real.
And when it was over, and the findings learned
Of the risks in the beginning that give such concern,
I'm still thankful to have been a part
I know I have benefitted and I say this from MY HEART.

Ms. Sutton, a Kinston resident, participated in the Heart and Estrogen/Progestin Replacement Study (HERS). See JAMA 1998;180:605-13.

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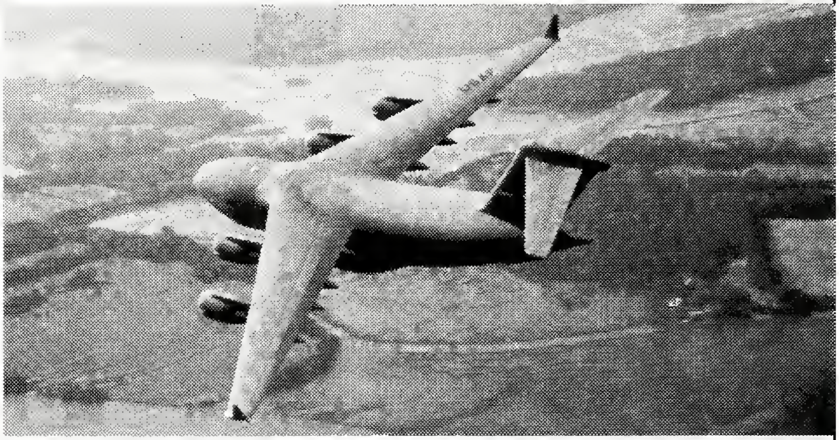

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APN 25-804-0004

Comparing the Severity of Obstructive Sleep Apnea in Patients Referred by Urban and Rural Physicians

W. Vaughn McCall, MD, Dianne L. Reynolds, MD, David M. Reboussin, PhD,
Edward F. Haponik, MD, Bryan Cooper, R EEGT, and Jack D. Edinger, PhD

Obstructive sleep apnea (OSA) is a common and treatable disorder. Left untreated it has serious consequences.[1] Despite a prevalence in the general population of 1%-3%,[2] clinically significant OSA is underrecognized by nearly all physicians,[3-5] in part because sleep disorders are not adequately covered in American medical schools.[6] Clinical experience alone is no substitute for education, however, since respected and established primary care physicians are demonstrably unlikely to inquire about sleep related-symptoms during interactions with simulated patients.[3] It is not clear whether proximity to a medical center with a sleep laboratory or other factors may partially compensate for lack of formal education in sleep medicine. The consequences of missed or delayed diagnoses seem self-evident, but little is known about the practical significance of differences in physician awareness or whether there are geographic differences in the recognition of OSA. In one investigation, urban physicians were more likely than rural physicians to refer patients to a sleep laboratory, despite a similar frequency of sleep complaints in their practices.[7] In the present study, we compared the severity of OSA at the time of formal diagnosis by polysomnography (PSG) in patients referred by rural-based physicians and urban-based physicians.

Methods

Subjects. Patients with a final diagnosis of OSA were identified from a comprehensive, prospectively established computerized database of all patients evaluated in our sleep laboratory between January 1994 and June 1996. We excluded patients under age 18, those with prior corrective otolaryngologic procedures for clinically suspected OSA, those referred primarily for suspected narcolepsy, a small number diagnosed with portable sleep testing equipment, and patients undergoing split-night protocols for their first PSG. We identified and retrospectively reviewed the charts of 100 consecutive adult patients with confirmed sleep apnea.

Prior to PSG, all patients completed a questionnaire that inquired about age, gender, race (white, nonwhite), body mass index (BMI), number of weeks of sleep symptoms prior to testing, and presence/absence of core OSA symptoms.

Provider characteristics. Our sleep center sees patients referred from large portions of northwestern North Carolina and southern Virginia. The catchment area includes both industrialized Piedmont cities and rural farmlands of the Appalachian foothills. We used the laboratory database to identify the zip codes of all selected patients and referring physicians. Zip codes were classified as either rural or urban by US Postal Service criteria.[8] We used the database to specify each referring physician as providing either "primary care" (internal medicine or family medicine) or "specialist care."

Assessment of OSA severity. The severity of OSA was assessed with a single night PSG that monitored 2-4 electroencephalograph channels, 2 electrooculograph channels, 1 chin electromyograph channel, a nasal/oral thermocouple, thoracic respiratory effort, abdominal respiratory effort, ECG, pulse oxim-

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Drs. McCall, Reynolds, Roboussin, and Haponik are affiliated with Wake Forest University School of Medicine, Winston-Salem: Drs. McCall and Reynolds are with the Dept. of Psychiatry and Behavioral Medicine, Dr. Reboussin is with the Dept. of Public Health Sciences, and Dr. Haponik is with the Dept. of Internal Medicine, Div. of Pulmonary Medicine. Mr. Cooper is with Diagnostic Neurology, North Carolina Baptist Hospital, Winston-Salem. Dr. Edinger is with the Dept. of Psychiatry and Behavioral Sciences, Duke University Medical Center, Veterans Affairs Medical Center, Durham. This work was supported in part by grants MH01090 and MH51552.

etry, and body position. Sleep stages were scored according to standard criteria.[9] Apneas were defined as 10 seconds or more of 90% or greater reduction in signal in the thermocouple channel; hypopneas were defined as a 50%-90% reduction in the thermocouple signal accompanied by either an arousal or arterial hypoxemia. The respiratory disturbance index (RDI) was defined as the total number of abnormal breathing events per hour of sleep.

Statistical analysis. The sample of patients was categorized on the basis of patient and physician residence as follows: Group U/u - patient urban, physician urban, Group R/r - patient rural, physician rural, Group U/r - patient urban, physician rural, and Group R/u - patient rural, physician urban. Data are presented as means (standard deviations). Differences among groups were tested by linear regression and ANOVA for continuous variables using 2 models: 1 with the Group variable by itself, and 1 with the group variable plus age, race, gender, and BMI. We subjected the RDI variables to log transformation to better approximate homogeneous normal distributions. Differences in proportions of discrete variables were tested by chi-square. Statistical significance was accepted at $p<0.05$.

Results

Demographic characteristics of patients. As Table 1 (next page) shows, our sample was typical of individuals thought to be at greatest risk of OSA (most were aging, overweight men). The mean RDI of almost 50 is consistent with significantly sleep-disordered breathing. Further complications of OSA include distorted sleep architecture (excessive percentage of stage 1 and decreased percentage of Rapid Eye Movement [REM] sleep) and clinically significant arterial hypoxemia.

Impact of patient/physician residence. The 100 subjects represented 76 referrals from primary care physicians and 24 from specialists; 80 were referred by urban (u) and 20 by rural (r) physicians. Tables 1 and 2, next page, outline relationships of patient and physician residence to clinical characteristics and OSA severity. Since there was only 1 patient in group U/r, this group was excluded from statistical analyses. There were 49 patients in group U/u, 19 patients in group R/r, and 31 patients in group R/u; the groups did not differ significantly from one another in age, gender, or BMI, or in the proportion of primary care versus specialty referrals. The proportion of nonwhite patients was lower in Group R/r (X^2=9.8, df=2, $p<0.01$) (Table 1, next page).

The difference between groups in total RDI did not quite attain significance using a univariate model (F=2.97; df=2,96; p=0.056), but after covariate adjustment for age, gender, race, and BMI, the RDI of R/r patients was significantly higher than the other groups (F=3.59; df=2,89; $p<0.05$) (Table 2). There were significant differences for the RDI with the patient in the supine sleep position (but not the lateral sleep position) both without (F=3.95; df=2,96; $p<0.05$) and with covariate adjustment (F=4.9; df=2,89; $p<0.01$) (Table 2, next page).

Sleep stages and the mean nadir of arterial oxygen saturation during apnea did not differ among groups during either REM or non-REM (NREM) sleep, with or without covariate adjustment. Characterization of providers as "primary care" or "specialist" did not affect the models for RDI. Gender and BMI were predictive of total RDI and lateral RDI, as would be expected since these are known risk factors for OSA.[4]

We explored possible reasons for the greater total RDI in Group R/r by examining the reported duration of symptoms before diagnosis, and the presence or absence of core symptoms of OSA. The mean duration of OSA symptoms (81.2 ± 54.7 weeks for the total sample) did not differ significantly between groups. The proportion of patients reporting classic OSA symptoms did not differ between groups, with the exception that symptomatic awakenings were more common in Group R/r (X^2= 7.4, df=2, $p<0.05$) (Table 3, next page).

Discussion

Our data show that OSA severity at the time of diagnosis was greater in rural patients referred by rural physicians than in other groups. This finding does not appear to be accounted for by the patients' place of residence since the RDIs of rural patients referred by urban physicians were similar to those of urban patients.

Only 20% of our patients were referred for PSG by rural physicians, consistent with the finding of Rubinstein et al that rural physicians are less likely to use PSG to assess sleep complaints.[7] The greater severity of OSA in Group R/r was not accompanied by greater distortion of sleep architecture as reflected by the percentage of time in sleep stage 1. However, it is possible that the global increase in stage 1 for the entire sample masked any smaller degrees of deterioration in sleep architecture. It is also possible that the frequency of arousals may have been greater in group R/r, but we did not record a separate arousal index

Limitations in our methodology restrict the scope of our conclusions. We cannot exclude the possibility of unintentional bias in this open, retrospective review of our laboratory database. Moreover, it is possible that our findings are peculiar to our facility, and rural providers are actually referring patients with milder OSA to other centers. Because we examined only those patients with OSA confirmed through PSG testing, ours is not a study of the prevalence of OSA in rural settings versus urban settings.

It remains possible that there are true epidemiologic differences among the groups and that rural OSA patients are phenomenologically different from urban patients, yet this seems unlikely given the similarities of the urban and rural patients referred by urban providers. It is more likely that varying practice behaviors among physicians explain the difference in groups. Rural providers may be slower than urban providers to

Table 1. Demographic characteristics of sleep apnea patients in urban (U) and rural (R) groups

	Group U/u	Group R/r	Group U/r	Group R/u	Total
	N=49	N=19	N=1	N=31	N=100
Age	47.9 (14.4)	53.3 (14.7)	43 (na)	49.8 (15.0)	49.5 (14.6)
Male/female (N)	27/22	15/4	0/1	16/15	58/42
White/nonwhite (N)	37/12	18/1*	0/1	17/14	72/28
Body mass index	38.2 (9.3)	36.8 (9.1)	43 (na)	42.0 (15.5)	39.2 (11.6)
Primary care/specialists (N)	35/14	18/1	1/0	22/9	76/24

Data are presented as mean (standard deviation) or as numbers of individuals

*$p<0.01$

Table 2. Polysomnography (PSG) findings according to urban (U) or rural (R) residence of patient and physician

	Group U/u	Group R/r	Group U/r	Group R/u	Total
RDI - total	45.3 (37.3)	65.1 (37.0)*	129.3 (na)	44.2 (41.5)	49.6 (39.7)
RDI - supine	49.0 (38.0)	76.8 (38.7)*	129.0 (na)	49.5 (38.6)	55.2 (40.0)
RDI - side	41.0 (40.6)	50.9 (46.9)	129.4 (na)	30.1 (38.9)	40.3 (42.5)
Stage 1%	31.9 (25.7)	28.5 (19.8)	23.4 (na)	33.3 (25.7)	31.6 (24.4)
Stage 2%	43.6 (20.9)	50.5 (17.6)	65.8 (na)	41.3 (22.8)	44.4 (21.0)
SWS%	10.2 (12.0)	6.7 (8.8)	0 (na)	10.5 (11.8)	9.5 (11.4)
REM%	14.5 (13.0)	14.2 (7.6)	10.8 (na)	11.4 (9.2)	13.4 (11.0)
Mean O_2 nadir - NREM	87.9(8.3)	86.4 (5.5)	90.0 (na)	86.9 (9.7)	87.3 (8.2)
Mean O_2 nadir - REM	79.9 (13.3)	78.2 (13.3)	77.4 (na)	84.6 (11.0)	80.8 (12.8)

Data are presented as mean (standard deviation)

RDI - respiratory disturbance index

SWS - slow wave sleep

*$p<0.05$

Table 3. Symptoms of sleep apnea according to urban (U) or rural (R) residence of patient and physician

	Group U/u	Group R/r	Group U/r	Group R/u	Total
Excessive sleepiness	33/16	15/4	1/0	24/7	73/27
Snoring	28/21	6/13	0/1	12/19	46/54
Observed apnea	16/33	4/15	0/1	5/26	25/75
AM headache	19/30	9/10	1/0	8/23	37/63
Insomnia	13/36	5/14	0/1	9/22	27/73
Awakenings	12/37	13/6*	1/0	17/14	43/57

Data presented as yes/no responses

*$p<0.05$

refer suspected OSA patients for PSG evaluation (although we found a similar duration in symptoms reported by patients). It may be that rural providers place greater weight than their urban counterparts on certain sleep symptoms before referring (our patients referred by rural physicians were more likely to complain of nocturnal awakenings). If true, this is erroneous behavior: snoring and observed apnea are the symptoms most predictive of OSA.[10-11]

Overreliance on reports of nocturnal awakening may exclude patients with significant OSA. Finally, rural physicians may use the same diagnostic approach as urban physicians, but refer only the most severe cases for PSG testing, and send the questionable cases to urban specialists for a second opinion before PSG testing. We cannot directly address these competing hypotheses, but our results are consistent with Rubinstein's conclusion that rural physicians are less likely to refer patients with sleep disturbance for PSG testing. This suspicion would be best addressed by a direct survey of rural and urban physicians' attitudes about the use of PSG testing in cases of suspected OSA. If the suspicion were confirmed, it would underscore a need for the education of rural physicians and facilitation of access to PSG testing. ❑

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The State of Women's Health in North Carolina

Vijaya Bapat, MD, MPH

North Carolina has a tradition of caring. As the millennium approaches, we need to take stock of how well we have cared for the women in North Carolina, determine where we need to go next, and map the strategy to get there. The Women's Health Report Card (see Appendix)—the first of its kind in the nation—represents a part of that "taking stock." It was developed by the Women's Health Section of the Division of Women's and Children's Health in the Department of Health and Human Services, in partnership with other divisions of the department (Epidemiology, Community Health, Mental Health Developmental Disabilities and Substance Abuse Services, the State Center for Health Statistics, and the Office of Minority Health). Other organizations (NC Equity, UNC School of Public Health, NC OB/GYN Society, Institute of Medicine, NC Council on Women, and the Cecil G. Sheps Center for Health Services Research) played key roles in this collaborative effort.

Purpose of the Report Card

We set out to develop a report card that would:

- Describe the state of women's health in North Carolina using objective data.
- Refine our understanding of issues affecting women's health to allow better provision of individualized care.
- Raise awareness of the community at large, of decision makers, providers of care, funding agencies, and others about women's health issues in North Carolina that require action.
- Call for needed actions on key issues.

The Process

We developed the report card using specific criteria to include health indicators:

- The indicator related to issues of significance to women's health;
- The indicator reflected our holistic approach to health;
- The data pertinent to the indicator were available and reliable;
- The indicator conveyed a meaningful and usable message.

Other issues of health significance that might have been included were eliminated after much deliberation. We decided not to include indicators for which reliable data were not available, although we hope to include such indicators in the future. National and regional data were not always comparable (or even available) for all indicators. We decided not to use national statistics, but to compare the progress of North Carolina to itself over time.

Organization

In the end, we deemed 9 categories of information significant to women's health throughout an average lifespan, and addressed these in the Report Card. Each category consists of several indicators and (with occasional exceptions) includes the data for each indicator for years 1990 and 1996. A letter grade is attached to each indicator based on the progress in improving the health indicator since 1990. Grades were based primarily on the percentage of change in the indicators from 1990 (or in some cases, 1991) to the current period. Generally, the following guidelines were used:

A = >25% improvement or current status remains very good;
B = 11%-25% improvement or current status remains satisfactory;
C = no significant change (between 11% improvement and 11% worsening) or current status remains mediocre;
D = 11%-25% worse or current status remains unsatisfactory;
F = >25% worse or current status remains very bad, + or - indicate where a grade falls at the threshold between two letter grades.

When data for only one year were available, we used regional comparisons or generally accepted standards for grading. The data apply to women over age 15 unless otherwise noted.

Data are broken down by race only where there is a substantial racial difference or where there is a message in the numbers. Racial data, appropriately used, allow targeting of

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resources and interventions where they are most needed, but interpreted incorrectly, can inaccurately stereotype people. We know that race is often not the cause of a problem but a reflection of, and a proxy for, economic or educational status, or of barriers to health care such as lack of access to care and to health information. We also know that the term "minority" does not imply a single, homogeneous category. Information about minority groups other than African American is often unreliable due to lack of data about the population and a small number of recorded health events. Despite these limitations, the committee did feel it important to specify HIV/AIDS in the African American population because of the extent of the problem, and the need for special attention to this group.

What Does the Report Card Say?

The principle message of the Report Card is that when we all work together, we get better. The "we" here includes the community at large—legislators, decision makers, funders, media, providers of individual care and of public health. Together we have made a difference.

Our accomplishments include:

- An increase in the number of women receiving early prenatal care.
- A decrease in the number of women smoking during pregnancy.
- An increase in the use of automobile seat belts.
- A decrease in the number of women committing suicide.
- An increase in the number of women receiving mammograms.

All these areas have received focused attention to increase consumer awareness, or been the target of specific laws (such as those requiring seat belt use or insurance coverage for mammograms), or have been part of a funded and implemented system for the training of providers, or an increase in funding to improve women's access to prenatal care.

We know that jointly we can improve the care of women in North Carolina, but the Report Card also highlights areas where we need to do better. These areas include reduction of HIV/AIDS, and the prevention (or early detection) of chronic disorders such as diabetes, lung and cardiovascular diseases. We need to improve our prevention, early detection, and provision of care efforts for victims of violence. We need to help women change unhealthy lifestyles. We need to better document the data we collect related to mental illness and substance abuse. We need to improve our capacity to serve women with mental illness or substance abuse, including better preparation and training of providers of primary care to women.

We need enhanced efforts to help minority women who, in general, have a higher burden of health problems. We need to make minority communities more aware of issues like the need for early detection of breast and cervical cancer, and the need for healthier lifestyles such as smoking cessation.

The Report Card gives us news we can use. Providers can use their privileged position of authority and influence to increase awareness of important health issues and to promote prevention practices. Providers can help identify many disorders early, enabling patients to practice secondary prevention. They can find out about community resources such as shelters for victims of domestic violence and help patients connect with appropriate agencies and resources. They can widen their scope of practice by learning to identify common disorders such as depression and substance abuse, and by learning effective counseling techniques such as those described in the "Guide to Counsel Women Who Smoke" (for a copy, call 919/715-3387). Providers can persuade decision makers in their community to appropriate funds or to pass legislation for needed services. Physicians can make a big difference. We are on the right track. Together we can go forward to help assure that the State of North Carolina is a healthier place for all its citizens. ❑

Appendix.

North Carolina Women's Health Report Card

Reproductive Health	**1990**	**1996**	**Grade**
Percentage of women initiating prenatal care after the first trimester[1]	24.3%	16.5%	A
Percentage of live births that were unplanned (June 1994)[2]			
All	NA	42.7%	C-
White	NA	32.2%	C
Minority	NA	69.0%	D
Percentage of women who smoked during pregnancy[1]			
All	20.7%	15.8%	B+
White	22.4%	17.4%	B
Minority	17.2%	11.8%	A
Percentage of live births with short interval from previous delivery[1,3]	15.6%	13.4%	B-

continued next pages

Infectious Diseases	**1990**	**1996**	**Grade**
HIV/AIDS cases among women per 100,000 population[4]			
All	9.4	19.9	**F**
White	2.3	3.7	**F+**
African American	35.3	78.0	**F**
Cases of sexually transmitted diseases (syphilis, gonorrhea, chlamydia)[4] among women per 100,000 population			
All	907.7	726.7	**B**
White	254.9	225.1	**B**
Minority	3057.7	2363.8	**C-**
Chronic Diseases			
Heart disease deaths among women per 100,000 population[5]			
All	325.8	290.8	**B-**
White	312.3	274.5	**B-**
Minority	378.8	358.3	**C**
Diabetes deaths among women per 100,000 population[5]			
All	27.2	31.7	**D**
White	20.5	23.0	**D**
Minority	55.9	70.1	**D-**
Breast cancer deaths among women per 100,000 population[5]			
All	38.6	35.3	**C+**
White	36.7	33.0	**C+**
Minority	45.8	43.8	**C**
Cervical cancer deaths among women per 100,000 population[5]			
All	4.4	4.6	**C**
White	3.0	3.7	**D**
Minority	9.9	8.2	**B**
Lung cancer deaths among women per 100,000 population[5]			
All	42.1	50.4	**D**
White	43.8	52.6	**D**
Minority	34.8	40.2	**D**
Chronic obstructive lung disease deaths among women per 100,000 population[5]			
All	28.9	41.2	**F+**
White	32.5	45.0	**F+**
Minority	12.8	23.0	**F**
Hospitalizations among women for hip fracture per 100,000 (age 65+)[6]	989.3	1206.8	**D**
Substance Abuse			
Percentage of women who are current smokers (age 18+)[7]	25.9%	21.9%	**B**
Number of women reporting a need for substance abuse services in the past year (1995; age 18+)[8]	NA	243,000	**C**
Mental Health			
Suicide deaths among women per 100,000 population[5]			
All	6.8	5.8	**B**
White	8.0	7.0	**B**
Minority	2.6	2.0	**B+**
Violence/Injuries			
Number of victims of domestic violence (age 18+)[9]	16,700	31,200	**F**

Homicide deaths among women per 100,000 population[5]	1990	1996	Grade
All	5.7	4.7	C
White	3.4	2.8	C
Minority	12.6	10.4	C-
Deaths among women due to motor vehicle injuries per 100,000 population[5]	14.8	15.2	C

Behavioral Risks

Percentage of women who are overweight (age 18+)[7]			
All	25.4%	29.4%	D
White	21.0%	24.3%	D
Minority	40.1%	45.8%	D
Percentage of women who do not engage in leisure-time physical activity (age 18+)[7]			
All	41.1%	41.9%	C
White	38.2%	38.7%	C
Minority	50.9%	52.3%	C
Percentage of women who do not always use seat belts (1991 and 1995; age 18+)	20.2%	8.0%	A

Barriers to Health

Percentage of women below federal poverty level[10]			
All	16.7%	NA	C-
White	12.8%	NA	C-
Minority	29.4%	NA	D
Percentage of women who could not see a physician at some time in the past year due to cost (1991 and 1996; age 18+)[7]			
All	15.1%	16.4%	C-
White	13.7%	14.4%	C
Minority	19.9%	22.3%	D

Preventive Health Practices

Percentage of women who did not have their blood pressure checked in the past 2 years (1991 and 1995; age 18+)[7]	2.5%	3.6%	B
Percentage of women who did not have a mammogram within the past 2 years (age 50+)[7]	39.8%	27.5%	A
Percentage of women who did not have a Pap smear within the past 2 years (for women age 18+ with no history of hysterectomy)[7]	16.5%	16.3%	C

Acknowledgments: *Data for this report were compiled by Paul Buescher of the State Center for Health Statistics and Priscilla Guild of the Cecil B. Sheps Center, University of North Carolina at Chapel Hill, with input from all partners.*

[1] Live birth certificates for all NC residents

[2] Telephone interviews of a random sample of 1143 women who had a live birth in June 1994.

[3] Short interval means 6 months or less from a previous delivery to the conception of the current live birth. First pregnancies excluded.

[4] Communicable disease reporting system, NC Division of Epidemiology

[5] Death certificates for all NC residents. Based on primary or underlying cause of death. Age-adjusted by the direct method using the 1990 NC total female population as the standard.

[6] Statewide hospital discharge data reporting system; NC hospitals.

[7] NC Behavioral Risk Factor Surveillance System (BRFSS), Office of Epidemiology, Division of Community Health, NCDHHS. BRFSS is an ongoing, monthly telephone survey for which data are collected from randomly selected, noninstitutionalized NC adults (age 18 or older). In 1996, about 1650 NC women were interviewed for BRFSS; their responses were then weighted to represent those of all adult women in the state.

[8] Substance Use and Need for Comprehensive Treatment and Services in NC's Adult Household Population, 1995, Research Triangle Institute. Telephone interviews of about 2900 randomly chosen women in NC age 18 or older.

[9] Number of primary victims of domestic violence reported to the NC Council for Women.

[10] 1990 US Census

Cherokee Prescriptions for Accupressure and Massage

John Henry McWhorter, MD, and Robert B. Davis, DDS

Local heat, massage, and pressure were used therapeutically in many ancient cultures. American Indians used such techniques as a first-line approach in many of their treatments. The medicinal manuscripts of the Cherokee, dating from the time of Sequoyah's introduction of a syllabary, but brought to our attention by ethnologists only at the turn of this century, give a new perception of this rich medical heritage. For example, persimmon wood "stampers" were used for massage in cases of rheumatism, probably from before the time of the Revolutionary War. Of course, massage and acupressure remain relevant in present-day practices in the US. Current literature portrays these practices as having developed during the past three millennia in China.

The Swimmer manuscript of the Cherokee is the one that details these modalities of treatment. It contains 96 formulas, 25 of which prescribe direct contact of practitioner with the patient. Typical instructions include pressing a warm palm on a colicky abdomen or using repeated thumb pressure over the site of toothache, but overall the common thread throughout the instructions is the idea of tactile interaction.

Six of the 25 formulas deal with management of pain in the abdomen, and several refer to this condition as being one of the "navel" or of the "yellow." Abdominal pain was to be managed in part by placing the hands flat on the belly and rubbing them down over the site of pain or tenderness. One formula for treating worm infestation recommended giving a purgative, then rubbing the hands over the abdomen in a caudal direction, following the path of excretion.

Some formulas give insight into the Cherokee conception of bodily function and illness. This can be seen in the prescription for treating the "yellow" (jaundice?): Warmed hands applied to the affected area were to feel the pulsations of the disease and scatter it under the touch.

Other applications of massage and accupressure run through the descriptions in the manuscript. For example, in treating headache a hand was to be rubbed on the forehead, or the patient's temple, or the back of the neck, depending on where the pain was described as most acute; in toothache, a warm thumb was to be placed firmly on the jaw over the aching tooth (repeatedly if necessary). These practices are consistent with contemporary ideas of treatment.[3] The application of pressure to a "sore spot" is supported by recent observations that direct mechanical stimulation of a "trigger point" can give symptomatic relief comparable to various injected medications.[4]

Modern-day acupressure constitutes an alternative therapy with roots in the ancient practices of both the East and West. It warrants further and careful investigation. Pain relief alone without analgesic drugs (with their risk of side effects and addiction) would be a boon for both patients and health care professionals alike. ❑

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The Deadly Progression

Anger, Rage, Insanity, and Violence in Our Schools and What We Could Do About It

Frederick Nesbit, MD

Violence by the present generation of schoolchildren makes headlines and news stories. But neither publicity about the violence manifested nor the remedies advanced to cope with it has brought success. The media tend to focus on causes, rather than on looking for meaningful answers. Pointing fingers at the educational system, at gun control, at the failures of parenting, of religious teachings, of law enforcement—these do not bring answers, even though they are issues of great importance.

We need to change our approach. We need to identify, then maintain close, persistent contact with those kids who are headed for serious trouble. They hold the answers to questions that we've not taken the pains to ask. What turns anger into rage and hatred, and then into violence? If we made a really concerted, constructive probe in that direction—if we care and show how much we care—we might be rewarded with a surprisingly successful payoff.

The Need to Change Behavior

We have a prime opportunity to focus on those youngsters already labeled "at high risk," but they are only the tip of the iceberg of those headed for trouble. The approach for carrying out any project aimed at this issue must be nonthreatening and nonjudgmental. What I propose is a two-pronged approach using the combined resources of educators and mental health professionals. The specific techniques used by mental health professionals and appropriate pharmacotherapy give us powerful tools for exposing and disarming potentially explosive situations. A growing number of mental health workers believe that in many instances rage is nothing less than momentary, uncontrollable episodes of pure insanity. Often, the person who has punched a hole in the wall will tell us that "something snapped," and that the person who carried out the act that took place "was not the real me." What follows are expressions of uncomfortable, painstakingly described feelings and even wonderment that such an act could have taken place. To the observer, this behavior *looks* inexplicable, but clues from past reactions and patterns of behavior fairly scream for attention. Too often we look the other way and ignore the cries for help.

Proof of this concept of insanity comes in the remarkable, often unbelievable improvement in mood and behavior that follows the use of small doses of antipsychotic (often along with antidepressant) drugs. These drugs include the newer "atypical" antipsychotic drugs such as risperidone (Risperdal) and olanzepine (Zyprexa) and, possibly, also quetiapine (Seroquel). Their effectiveness in squelching aggressive behavior has been established, and I don't think it could make such a difference unless we were are in fact dealing with psychosis.

Another way of looking at sudden, violent behavior is to acknowledge that each of us carries within us a threshold of intolerance. For some, the threshold is higher and it takes more provocation to reach it; others have a sensitive trigger point and act less inhibited to a given stimulus. To put it bluntly, we all, without exception, carry a reservoir of insanity within. It is just more easily ignited in some of us.

Months or years of harboring ill feelings leads to hatred, low self-esteem, uncaring attitudes about the worth of human life (including one's own), loss of hope, loss of a sense of identity, diminished inhibition of unbridled anger. These lead on to actions that can eventually become heinous crimes. Their origins lie in failed attempts at achievement, in expulsion or exclusion from a desirable peer group, in remarks that wound sensitive feelings, in outright rejection following a real or imagined close relationship. There is a building up of paranoia and need for desperate retaliation. A deluded perpetrator may carry out an attack, believing it a necessary protection against a perceived threat. What we must address is the question of how to identify these situations, anticipate the likelihood of danger and seize the opportunity to take appropriate preventive action.

Nowadays, we often use drugs for youngsters who have been branded with labels such as attention deficit disorder, hyperactivity, antisocial behavior disorder, oppositional defiant disorder, and the like. Many parents and teachers have experienced satisfaction in seeing major success in taking these drugs. There is striking improvement in mood, in peer relations,

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in reduction of aggressive behavior, in sleep and eating habits, in scholastic and sports performance, and in awareness and concern about the feelings and needs of their significant others. Conventional attitudes opposing the use of antipsychotic drugs have been a prime obstacle to their more widespread use. Perhaps it's the term "antipsychotic drugs" that alienates parents and others. Why not instead call them "anti-rage" drugs!

A Two-Pronged Attack

The judicious use of appropriate drugs is only part of the answer to helping with adolescent behavior and emotional problems. Used alone, drugs do not offer any magical cure, although they do bring perceptible benefits. But another useful and underused tool ought to become a routine part of the school curriculum: the acting-out of troubling situations as if on the stage of a theater. Call it psychodrama (the name popularized by Moreno) or any other name that is acceptable for inclusion in a school setting. Let it become a nonthreatening and enjoyable part of students' total education. It will allow them to express generally unacceptable impulses in a protected setting, and bring out hidden, uncomfortable, and "forbidden" material.

Just what is psychodrama? Its techniques and variations can be summed up briefly: The class sits in a circle, and the teacher (or pupil) who is designated as group leader solicits suggestions of what the group would like to see acted out. A vote is taken to choose the topic. Volunteers are enlisted to act the parts in the proposed drama. The actors decide how to carry this out. The theme is then enacted in the center of the circle. Following this, there is discussion by the entire group.

There are many variations in technique, but a popular one is role reversal in which the same actors repeat the drama, but exchange roles. For example, suppose an actor plays the part of a child in trouble who comes home to be lectured by stern parents who impose restrictions or punishment. On replaying the scene, the "stern parent" becomes the "defiant child," and a new discussion ensues. The issue of confidentiality does not enter the picture. No personal problems will be exposed except perhaps in a very general way, and where others in the group can identify with their own situations and lend support.

Those who participate in such controlled acting-out acquire skills in socializing and gain self-confidence. The sessions can help youngsters who might otherwise have no access to any sort of assistance with their mental health. Of course, generous tolerance and support is needed from the leaders who may have to listen to the most outrageous and obscene kinds of expression. Given license, group members come to realize the opportunities and freedom for venting otherwise unacceptable material in a forgiving and safe setting.

This is a hasty description of what psychodrama is like. It is impossible to describe the emotional impact on the participants and observers when everyone in the room gets involved. Suffice it to say that a more radical approach in this direction is badly needed if we are to make gains in conflict resolution, assuring the physical safety of teachers and students, and bringing about progress in mental health. I propose collaboration between educators and psychiatrists who specialize in psychopharmacology. I believe that it could yield important clues to vital questions that are begging to be asked!

Note that one-on-one counseling , or any kind of "psychoanalysis," is excluded from this voluntary program. Again, much of the violence that we see is the result of rage, the equivalent of temporary insanity. Thus my idea for heading off some of the disasters that are making headlines, and which are not limited to any special geographic areas or groups of people. Jointly implemented, role-playing in spontaneous drama productions as part of the school curriculum, plus a decent trial of *voluntary* pharmacotherapy for those at high risk, will give us the means to uncover and to resolve malevolent and violent impulses and to convert them into more healthy outlets.

I recommend that the first step be training sessions (see box below) for teachers interested in becoming group leaders for mini-dramatizations. In my own practice, I use video equipment for playback to the participants, for documentation, and for training purposes. Anonymity of the participants is retained, although records are maintained of issues addressed, topics discussed, and group process. The technique of performing is simple and easily learned, and the principal requirement for leadership is a strong dedication to put forth the time and effort. A protocol is available with specific details for organizing such a program. Teamwork and interplay between educators and mental health workers can bring an end to the current atmosphere of terrorism now becoming pervasive in our schools. This kind of project will constitute a frontal attack on the threats of violence among our upcoming generation. ❑

Psychodrama training course for teachers. Proposal for 9, 50-minute training sessions

1	Historical perspective and theoretical background. Dynamics involved.
2	Spectrum of therapeutic uses and techniques.
3-4	Two sessions demonstrating techniques of videography. Hands-on technique of using the equipment
5	Demonstrations of psychodrama, using TV. Desensitization of trainees to being videotaped.
6	How to conduct a drama session: How to start up the session, how to recruit volunteers, dealing with a student's resistance to participation or to being recorded, closing the action, preserving and respecting the ideas of the audience and avoiding contamination by the leader's personal biases, or impulsive tendencies to dominate.
7-8	Two sessions on experiential leadership with group critique and playback.
9	Observation and supervision of trainees in action, followed by consultant's suggestions.

Notes From My Malpractice Trial

Phil Sellers, MD

The Jury's Decision

On Friday the 13th in March of 1998, at 11:30 a.m., a 12-person jury convicted me of negligence. The jury awarded the plaintiffs, the widowed Mrs. N and her three children $700,000. The trial took place in Superior Court at the Henderson County Court House in Hendersonville. The Honorable Jud Downs presided.

Postmortem exam had revealed that Mrs. N's husband, Mr. N, age 43, had a healing myocardial infarct, which appeared to be about 4-6 weeks old. There was a 95% obstruction of the left anterior descending artery with clot formation and an acute myocardial infarction that was 16 to 20 hours old.

According to the judge's instructions, the jury had to answer 3 questions: 1) Was I negligent? 2) Was Jerry Pyles, my medical partner, negligent? and 3) If either or both of us were negligent, what should the dollar amount of the judgment or settlement be? But one of us had to be found negligent before any money could be awarded.

After the verdict, conversations with 5 jurors, including the foreman, indicated that the jury was initially divided between those who wanted to find in favor of the plaintiffs and those who strongly felt there was no negligence. It seemed there would be a split or hung jury, but after much discussion they worked out a compromise settlement: they would reduce the requested settlement amount of $5 million to $700,000, and find one of us guilty of negligence. They decided on me because of the jury's recollection of a difference between my testimony and that of Mrs. N about a telephone conversation on Friday, November 19th, 1993. Mrs. N agreed that I told him to come in if he had more trouble, but some of the jurors thought I should have talked to Mrs. N after I talked to Mr. N and insisted that she bring him to the office or the emergency room. The jury thought my documentation of the telephone conversation was not adequate. It became a case of "her word against mine."

The plaintiffs' three expert witnesses said Mr. N should have been hospitalized for unstable angina when seen in the ER on the 17th, or by Dr. Pyles in our office on the 18th, or by me when I talked to him on the telephone on the 19th. Our 2 medical experts testified there was no negligence or deviation from the standard of medical practice.

The Case

I had not seen Mr. N face-to-face in more than a year. At our last visit, he had nothing seriously wrong, and was working actively as an electrician. My total involvement during the final year of his life was 2 telephone conversations on the last days. The first conversation occurred on the night of November 17th when I got a call from an emergency physician at Pardee Hospital. Mr. N had experienced two episodes of squeezing left upper chest pain with radiation to the left shoulder and some numbness down the left arm. The episodes had lasted 10 minutes or less. Both had occurred more than 4 hours before coming to the ER, one while grocery shopping and one while cooking supper. He called 911, but when the emergency crew arrived, he had no complaint. He refused to come to hospital by ambulance, but agreed to let his wife drive him.

In the ER he was asymptomatic. During the preceding day, his work as an electrician had involved significant physical activity, but he had had no pain. A month earlier my partner, Dr. Pyles, had prescribed nicotine patches at Mr. N's request because he had wanted to stop smoking. In the ER, he said that the chest pain had been relieved when he took the patch off.

The physical examination, ECG, chest x-ray and serum level of creatine kinase (MB isoenzyme) were all normal; total creatine kinase and lactate dehydrogenase levels were slightly elevated. At that time nicotine patches had been newly introduced and 3%-9% of users were reported to complain of chest pains or myalgias, although there was no long-term experience with possible side effects. The provisional diagnosis was nicotine patch-induced chest pain.

Mr. N remained stable and symptom-free in the ER. I was

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on call for our medical group that night and the ER physician called me before discharging him. He reviewed Mr. N's symptoms and findings, and his recommendation that Mr. N be discharged to go home. I raised the question of coronary artery pain, remembering that Mr. N's father had a myocardial infarction at a young age. In addition, I expressed some doubt as to whether the nicotine patch could cause chest pain, but the ER physician cited the temporal relationship between removal of the patch and resolution of the pain. I agreed to his discharge with the proviso that he return to the office the next day for follow-up.

The next day in the office, Mr. N reported no more trouble. Dr. Pyles saw him and felt his problem was musculoskeletal. He strongly urged that Mr. N stop cigarettes and restarted nicotine patches but at a 7 mg rather than the previous 21 mg dosage. That night Mr. N and his family attended a skydiving performance, and went to dinner in Greenville, SC.

He developed symptoms the next afternoon, and I had my second telephone conversation about him. Mrs. N called the office and my staff got me to the phone. She was very upset, wanted to know what was wrong, and how we could find out what was going on. She described 2 episodes of chest pain (of 1-2 minute duration), associated with shortness of breath and "looking bad." I could not tell what was going on, but worried about cardiac arrhythmia, coronary artery disease, even pulmonary emboli. I told Mrs. N we might need cardiac monitoring or exercise stress testing. I told her that I did not know whether the spells were serious or not, and I would have to see him to evaluate the problem.

To get a better fix on the problem, I asked to speak to Mr. N. I was really surprised when he answered with a calm voice and no apparent distress. He said, "I had another one of those spells." When I asked how he was, he responded, "I'm okay." I said, "[Your wife] is really upset and this sounds serious." I said that we could not tell what was going on, but we needed to find out. I told him to come in to the office that afternoon, but when he said again that he was "feeling okay," I doubted that I had convinced him. I told him that if he had any more trouble day or night that he should come to the office or to the ER. He did not come to the office. He had no further symptoms.

The next day he got up without complaints. He fixed breakfast for his kids and ate without any apparent difficulty. Two friends were putting an addition on his house, and he instructed them as to what to do. Later in the morning, his son found him lying on the floor with his feet up. He said he was dizzy. His son asked if he could get him some help. He said "No" and got up as if nothing was wrong. Twenty minutes later he was again lying on the floor with his feet up, complaining of dizziness. The son again asked if he could help, call the doctor, or call 911. Mr. N said "No," and subsequently got up and fixed lunch for the family and his friends. He ate lunch without complaint. After lunch he said he was tired and laid down on the couch. His son came in 20 minutes later and found him dying of a cardiac arrhythmia.

What I Learned From My Trials

- Mr. N probably had significant cardiac symptoms and denied them. He had had a myocardial infarction 4 to 6 weeks before, but had not sought medical advice. He probably asked for help with stopping cigarettes because of cardiac symptoms.
- Mr. N did not come for help despite my explicit advice to do so during our November 19th telephone call. He twice rejected his son's offer to get help on the 20th.
- I did not find justice in the jury system. I thought I could convince 12 rational people I was not negligent. I did not. I now realize that laypeople do not adequately understand the process of medical decision making or judgment, particularly when there is conflicting testimony.
- My testimony in the trial was not believed or not remembered by the jury. They asked for transcripts of the telephone conversations, but did not get them. My documentation of the November 19th telephone call included the final conclusion but not a detailed account of the conversation.
- Physician judgment (as expressed by the defense's expert witnesses) about the significance of the patient's complaints of chest pain were not believed or deemed to be important. The jury did not believe I met the standard of medical care for our community and concluded I was negligent.
- On the other hand, I did not and do not think I was negligent.
- The jury may have decided to award a financial judgment before deciding negligence. This was clearly not the charge by the judge to the jury. Sometimes when there is a bad outcome juries feel that someone (an insurance company or a physician) must pay, even though there was no negligence.
- I could have been financially devastated. I had $1 million in malpractice insurance. The plaintiff wanted $5 million. The jury awarded $700,000.
- I believe that the decision in this case clearly demonstrates the increasing risk of liability under which physicians practice today. As a result, I and other local physicians have become much more defensive in our practice of medicine. The pendulum has swung in the direction of taking fewer and fewer or no risks. This means the costs of defensive medicine have risen and will continue to rise. More tests will be done, many unnecessary and some, like cardiac catheterization, at risk to the patient. More hospital services will be used. Medical costs will go up.
- We need a jury system that includes true peers (such as other physicians) for medical malpractice cases.
- If North Carolina had a limit on liability for punitive damages as there is in several states, this case may well not have happened.
- We need malpractice legislative reform in North Carolina. All physicians in this state need to join the Medical Society in its drive to accomplish the needed reforms now. ❑

A Dig Doctor in Israel, June 1997

Patrick D. Kenan, MD

In the lower Galilee region of Israel lie the remains of an enchanting and beautiful city called Sepphoris. Actually, it is the remnant of several cities, ruins layered atop earlier ruins from the Bronze Age (3400-1200 BCE) through the Iron, Hellenistic, Roman, and Byzantine Ages, and beyond. It is close to Nazareth (about 5 miles away), and the fact that Joachim and Anne, the parents of Mary, mother of Jesus, lived there make it highly probable that Jesus visited there before beginning his ministry, although Sepphoris is never mentioned in the Bible. Sepphoris was a Roman provincial capital and a major Jewish city. It was a place of religious pilgrimage for Jews and Christians, and a Crusader stronghold in the 12th century.

The first excavations at Sepphoris were begun in the early 1930s by teams from the Hebrew University of Jerusalem, and separately from the University of Michigan. In the early- and mid-1980s, other universities became involved and the Joint Sepphoris Project was begun in 1985. Professors Eric and Carol Meyers of Duke University's Department of Religion, the directors, are world-class archeologists with years of experience on "digs." They have earned the admiration of their peers and students for their contributions, including the exciting discovery in 1987 of a nearly perfectly preserved mosaic displaying the life of the Greco-Roman god Dionysus. On the border of the mosaic is the hauntingly beautiful face of a woman, now known the world over as the "Mona Lisa of Galilee."

Getting Ready to Go

I have known Eric and Carol Meyers for several years, and through a mutual friend, I learned of their need for a doctor to attend the 50 or 60 students and staff members who were to make up the 1997 dig party. As a retired physician, I applied for the job and was accepted. Thus began one of the greatest adventures of my life! Preparation for the dig included reading appropriate material on the Sepphoris and related projects, meeting with Eric and Carol, visiting a display of the Project at the North Carolina Museum of Art, and purchasing sturdy boots and other field equipment. I got into the best physical condition possible (probably the single most important thing I did in preparation). I regularly work out at an athletic club, but I intensified my strength and stamina training. A visit to the Duke International Travel Clinic provided very valuable information regarding public health measures, security advice, and immunizations against hepatitis A and B, polio, tetanus, and typhoid.

I prepared for my role as the "dig doc" by visiting Catherine Severns, a physician assistant in the Duke Family Medicine Clinic, who had served on several previous digs. Together, we formulated a list of medicines and supplies that would be desirable to have. I needed several different antibiotics, including ciprofloxacin for bacterial dysentery, various analgesics, a host of gastrointestinal medications (antinauseants, antidiarrheals, antispasmodics, and antacids). A variety of antihistamines, steroid creams, and prednisone were considered desirable. For more serious emergencies, I needed several epinephrine injector kits, antibiotic eye drops and ear drops, oral glucose kits, as well as 50% glucose for intravenous administration should we have anyone with diabetes in the group.

Supplies included a variety of needles and syringes, local anesthetics, sterile dressings, adhesive tape, sutures, clamps and scissors, elastic bandages, splints, sunscreen, disposable gloves, tongue blades, and snake bite kit. I submitted my list of needs to a senior administrator in the Duke pharmacy, and the entire package was provided virtually free of charge, since this was for a Duke-sponsored program. Talk about generosity. Needless to say, I was extremely grateful.

At Work in Israel

On Friday, May 23, 1997, I took off for 4 weeks of a great adventure. I had an uneventful TWA flight to Tel Aviv, then a long coach ride to our quarters at Mispeh Hoshaya, near the Sepphoris dig site. I settled into clean, comfortable dormitory accommodations, had a nutritious but no-frills meal in the dining hall with all the students and staff, and attended a lecture outlining our daily routine. Every day proved very much the same: up at 4 a.m., coffee and rolls eaten on the run, arrive at the dig site by 5. We were digging within minutes of arrival. Breakfast in the field at 8—usually sandwiches made of various

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Scenes from the dig: Clockwise from above—Dr. Kenan measures the depth, and thereby the date, of the excavated area. An amphitheater, unearthed and restored by the Duke team. The author, kneeling, digs at the site.

meat spreads, hummus, tomatoes and cucumbers, hard boiled eggs, and yogurt. There were jokes to entertain and maintain morale. Back to digging in 30 minutes, until the break at 11 for fruit or melon (the best melons on earth come from Israel!), then more digging until 12:30 p.m.

It was too hot to dig in the afternoon so we went back to our dorm for showers and lunch, and 2 or 3 hours of naps, rest, or reading. Then everyone was out to wash and dry the day's collection: pottery shards, animal bones (sheep and goats, fish, cattle—even pigs—all of which provided clues to the people's dietary habits), occasional coins, perhaps a lead figurine. By Israeli law, human remains are off-limits to dig parties. The staff members would "read" the material, dating its origin as from the Bronze, Iron, Hellinistic, Roman, or Byzantine ages. I learned that the style of pottery and coins especially are the most accurate way to date the excavated materials. The nature of the find, its precise location, its historical period, its elevation (depth), artists' sketches and photographs were all entered into the database of the project to create a computer-generated map of the dig site. Given the fact that succeeding generations built atop earlier ruins, we were going back in history with each layer of excavation. Fascinating, to say the least!

The evening meal (at 6:30 p.m.) was followed by a lecture at 7:15. The lectures were quite extraordinary, and covered such diverse topics as basic archeology, glass making as an ancient art, iconology, amulets, Jewish law, theology, the various historical ages "through" which we were digging, and the recurring question, did Jesus visit Sepphoris? We were in bed by 8:30 or so, preparing for a 4 a.m. wake-up, and a repeat of the same process the next day.

I was there as "dig doc," but also to dig, and if I do say so, I performed well in both roles. Without question, this was the hardest physical labor I have ever done. I was in good condition when I started, but even stronger when I finished 4 weeks later. It's been said the Pyramids would never have been built without slave labor, to which I would add there would be no archeological progress without another form of "slave labor"—students and "dig docs." The students paid for the privilege, and got college credit for their participation. I paid only airfare (fairly inexpensive group rate), and received board and room for my services.

Medical Duties at the Dig

My main obligation was to render primary care and first aid. There were adequate secondary care facilities in nearby Nazareth, and tertiary care in Haifa and Tel Aviv. Fortunately, I never had to rely on those facilities, and was able to cope with every problem that arose with one exception. A student injured her knee playing basketball, and I suspected a ligament tear, which justified sending her home for management. I later learned she had torn the anterior cruciate ligament, and required surgical repair. Glad I made the right decision!

I was prepared for scorpion stings and pit viper bites, but fortunately, neither occurred, though we saw (and killed) both. One student fell into a dig site when a balk (wall) gave way, but other than a bruised thigh and hyperextended wrist, there was no serious injury. The previous year, a broken leg had required hospitalization in Nazareth for traction and then casting before returning home.

The most significant medical problem was an epidemic of viral enteritis sweeping Israel. The Ministry of Health cited 40% incidence in some areas, which was about our rate of affliction, but fortunately, not all at once! No more than 5 or 6 (10% of the total group) were affected at any one time. The syndrome consisted of nausea and vomiting, diarrhea, headache, body aches and pains, chills and fever, and extreme lassitude. Fortunately, I never succumbed, but even more fortunately, I was well equipped to deal with the problem. Thank heavens for Imodium AD, Pepto-Bismol, antinauseants, analgesics, antipyretics, and ciprofloxacin. I came well-prepared to care for those afflicted.

Another common problem was dehydration and heat prostration. The temperatures during the work day hovered around 100° F, but the nights were downright cold. Yes, all of us carried water to the field, and indeed our supervisors enforced the frequent mandatory water breaks. It's easy to say the victims of dehydration did not drink enough water, but it was more complicated than that. It seems that one of the prime goals of the students was to come home with a great tan. Many used no protection—no hats, no sunscreen; girls in short shorts and halters, boys with no shirts, no socks, no gloves (they didn't want white lines at their ankles and wrists). Their moist, exposed skin would cake with dust, retarding evaporation of sweat and leading to hyperthermia. Almost every day 2 or more would have to go back to the dorm because of heat problems. Those, like myself, who were adequately covered and screened, would sweat profusely into our clothes, but the continuous evaporation kept us relatively cool. As long as we drank 2 to 4 quarts of water, we tolerated the oppressive heat well. Thank heavens for the low humidity.

Then there were the smokers: About 60% of the group smoked, and were taking frequent cigarette breaks. This habit probably contributed to decreased evaporation because of the vasoconstrictive effects of nicotine. Hence another factor in hyperthermia.

The Side Effects

Many fringe benefits went with the trip. There was a visit to Jerusalem and the Old City, a bus tour of the biblical sites around the Sea of Galilee, a tour of the Golan Heights (where over a third of all water in Israel originates, hence its strategic importance), and visits to other archeological dig sites including the largest one in Israel, Tel Bet She'An, which has been excavated over a period of several decades by the Israeli government. This particular site spans 6000 to 8000 years, and has great historical significance because of the battles fought there under the leadership of kings and generals we learned about in Sunday school as children—David, Saul, Joshua. As far as I can tell, all of the excavations are aimed at discovering, documenting, and preserving the history and culture of the various ages of Israel. What makes it all the more fascinating is the commingling there of 3 great religions—Judaism, Islam, and Christianity. I spent a weekend with old friends in Tel Aviv where I witnessed traditional Jewish family life in the celebration of their Sabbath. I enjoyed that as much as anything I did the entire trip.

On the dig, I was able to find some fascinating artifacts, a few of which I was allowed to bring home. I have a beautiful piece of 4000-year-old glass as a souvenir. I found northern Israel as beautiful and verdant (thanks to irrigation) as any place on earth (the Garden of Eden perhaps?), and I came to love and respect the Israeli people for their extraordinary accomplishments in the face of overwhelming obstacles, adversities, and indeed adversaries.

We experienced one bomb scare in Tiberius, which threatened to make us miss our flight home, but in the end, did not. Apparently bomb scares happen rather often, and the police and military take them quite seriously. The bomb squad is immediately on the scene, people do not panic, and order prevails. Unfortunately, bombings do occur, and not 2 weeks after my return, a bomb explosion in a large public marketplace in Jerusalem killed a number of people and injured scores.

I was often asked what aroused my interest in archeology. I replied that it was my interest in the history of Israel and its people, the geography of the country itself, comparative religions, and the birthplace of Christianity. Archeology was a good way to tie these many interests together, and have fun doing it. Would I do it again? Maybe; maybe not, given the fact it can definitely take its toll on one's knees, lower back, and other arthritic joints. It was physically demanding, but great to know that, at age 67, I was as strong as ever, and could out-dig some students 45 years younger. I learned that the young women were every bit as strong as their male counterparts, and often displayed more stamina. In the name of chivalry I offered to lift the heavier loads of dirt for the women. Believe me, it wasn't necessary, and generally my offers were unappreciated.

Many retired physicians would surely find participating in an archeological dig a fascinating and rewarding experience, and one where their medical services could be put to good use. It's a great way to travel, to learn, and to serve. To be sure, the political lability of the Middle East, and the possibility of terrorist activity keeps one constantly on guard, but if you have a spirit of adventure, being a "dig doc" is a great way to go (no pun intended). It was a great adventure, and a most rewarding experience. I am glad I went! ❑

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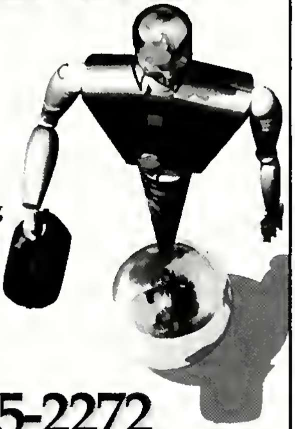

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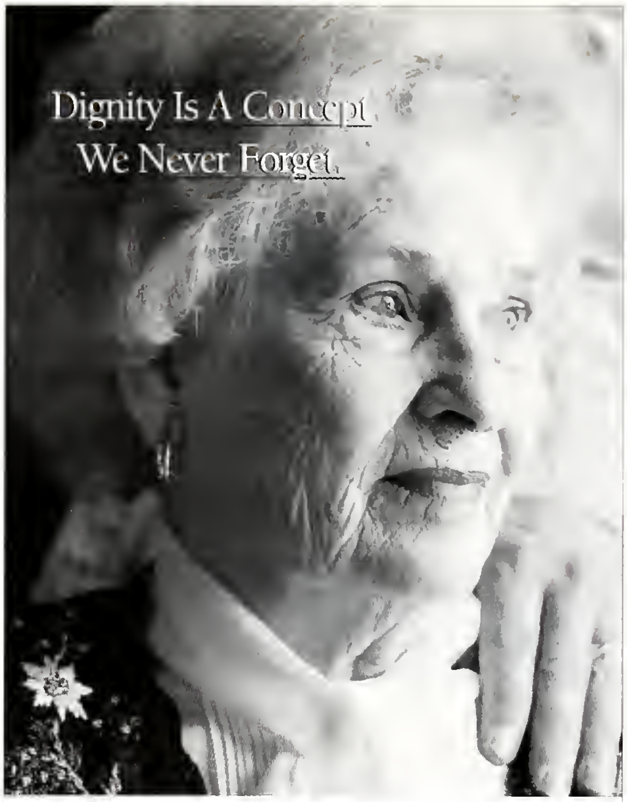

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Translaryngeal Puncture in a Collegiate Fencer

Jeffrey P. Campbell, MD, Richard E. Brownlee, MD, Mark C. Weissler, MD, and Stanley J. Martinkosky, PhD

Penetrating injury to the neck represents a relatively common clinical problem for the otolaryngologist/head and neck surgeon. Gunshot and knife wounds to the neck received during personal assaults and motor vehicle accidents remain the most common causes of this type of neck injury. Traditionally, these injuries are explored if the wound penetrates the platysma muscular layer.

In this article we describe a specific type of unusual injury resulting from a subtle fault in protective equipment worn by a collegiate fencer. The patient reported receiving an apparently superficial penetrating injury to the neck with his opponent's foil. The foil, after fracture of its protective tip during a lunge, penetrated the protective garment made of Kevlar. The foil produced a midline translaryngeal puncture wound in the supraglottic region. This injury was successfully managed without surgery with no adverse sequelae.

Fencers and all users of Kevlar protective equipment should routinely inspect and replace equipment that appears worn or frayed (even if this fraying occurs at the edges of the garment). Otolaryngologists/head and neck surgeons should diligently investigate such foil injuries because they may appear superficial but penetrate deeply because of a combination of the large force generated by the lunge and the minute area of the foil tip. Management of these injuries should be based on the history, physical examination (including fiber-optic nasopharyngoscopy), and radiographic studies (e.g., plain films and angiography if indicated).

Case Report

A 21-year-old male collegiate fencer went to the emergency department of the University of North Carolina Hospitals after a penetrating injury to the neck suffered during an épée fencing match. The patient's opponent lunged with the foil directed at the neck. According to spectators, the protective tip of the opponent's foil fractured, and the proximal tip penetrated the patients' Kevlar neck shield. This resulted in a puncture wound to the patient's neck. The patient was asymptomatic after the injury, except for some minor pain, but went to the emergency department on the request of his coach. The patient was afebrile and had normal vital signs on arrival to the emergency department. The otolaryngology/head and neck service was consulted, although the emergency physician thought the wound was superficial on examination. Examination of the patient revealed a young man in no acute distress with a very small puncture wound to the midline anterior neck approximately midway between the superior border of the thyroid cartilage and the inferior border of the hyoid bone (Fig. 1, next page). The remainder of his general physical examination was unremarkable. Indirect mirror laryngoscopy revealed a small amount of blood superior to the level of the vocal cords. Fiber-optic nasopharyngoscopy revealed mucosal puncture wounds in the region of the epiglottic petiole and the adjacent posterior pharyngeal wall (Figs. 2, 3, and 4; next page). Cervical spine series and soft tissues plain radiographs of the neck were unremarkable. Speech pathology testing of phonation was within normal limits.

The patient was admitted to the otolaryngology/head and neck service for observation and a brief course of intravenous antibiotics (ampicillin sodium/sulbactam sodium 3.0 gm intravenously every 6 hours). He remained afebrile, and his pain gradually diminished. He was discharged from the hospital after 1 day and took cephalexin 250 mg orally 4 times daily for 1 week. The patient recovered well and was seen both 3 days and 2 weeks after the injury, at which time repeat nasopharyngoscopy revealed a normal, well-healed supraglottic larynx.

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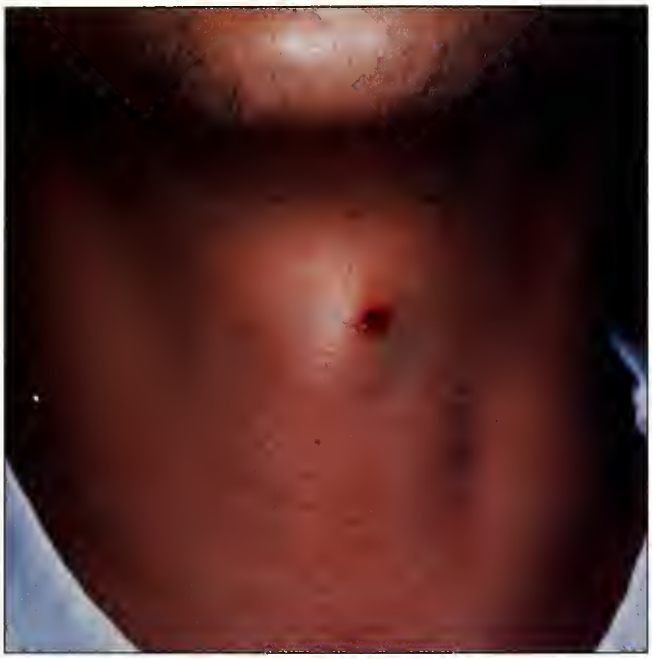

Fig 1: Frontal view of neck shows entrance wound slightly left of midline and approximately midway between the superior edge of the thyroid cartilage ala and the inferior border of the hyoid bone.

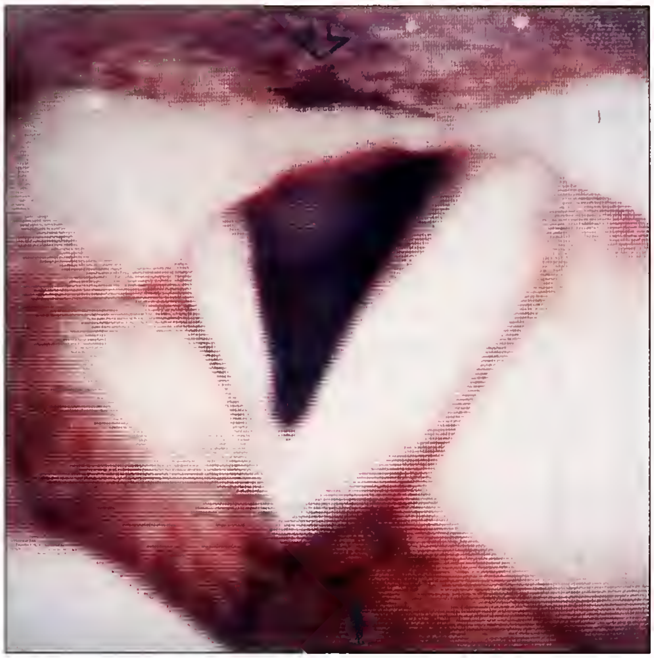

Fig 2: Endoscopic view of larynx. Closed arrow indicates anterior mucosal puncture wound in region of epiglottic petiole. Open arrow indicates wound in posterior hypopharyngeal wall/ prevertebral region.

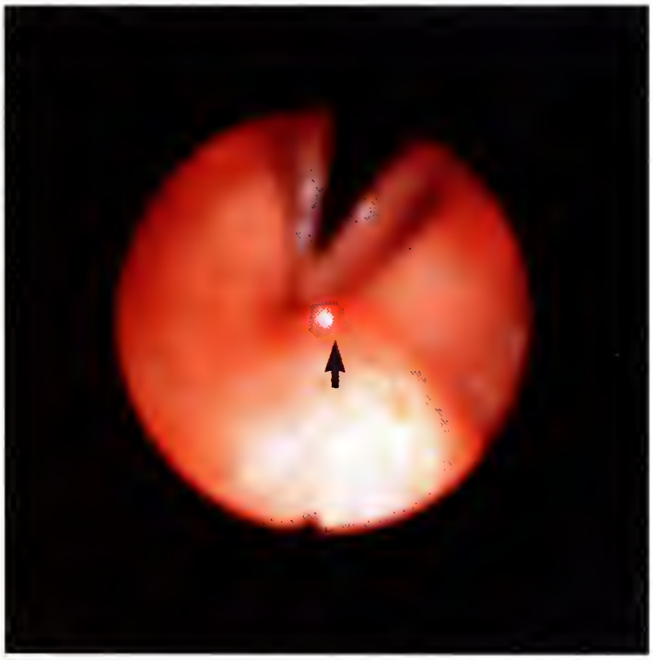

Fig 3: Endoscopic close-up view of anterior epiglottic wound.

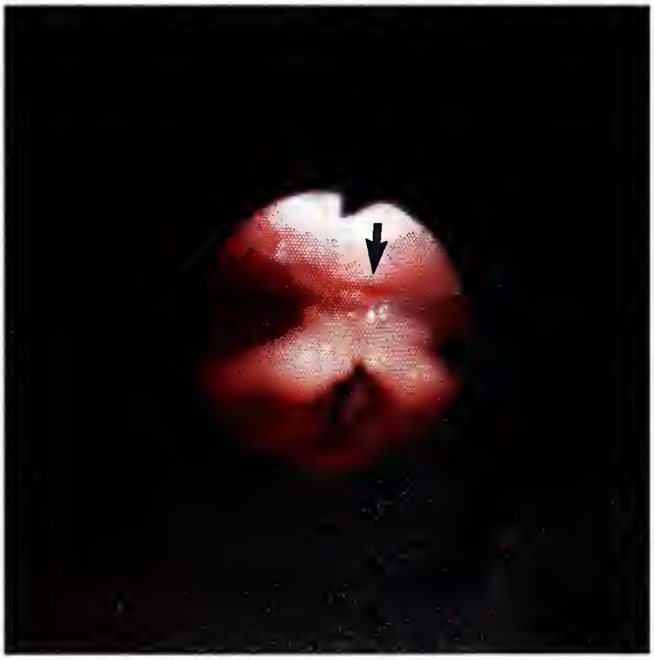

Fig 4: Endoscopic close-up view of posterior hypopharyngeal wound.

Discussion

Because of the great forces generated by the lunge and the minute surface area of the foil, the risk of penetrating puncture injuries is high in the sport of fencing. Protective equipment consists of a wire mesh facial shield, with the remainder of the body being protected by Kevlar fabric. In this case, the foil penetrated the attached Kevlar neck piece apparently because of a frayed edge of the fabric adjacent to the penetration site (Fig. 5, next page). The fraying loosened the woven Kevlar yarn and therefore allowed penetration by the foil, a weapon with a small surface area. Interestingly, the common denominator in reported fencing deaths and injuries all involve fracture of the foil with penetration of the proximal tip, as in this case. The only reported case of death caused by a fencing injury in the English literature involved a through-and-through neck injury with penetration of the common carotid artery and trachea.[1,2] This suggests that prevention of penetrating fencing injuries lies in development of materials other than steel for manufacture of the foil. Although other materials have been tried experimentally, it has been maintained that they unacceptably alter the nature of the sport. This is apparently an underrecognized mechanism of possible injury among fencers and possibly other users of Kevlar protection.

> "...prevention of penetrating fencing injuries lies in development of materials other than steel for manufacture of the foil. Although other materials have been tried experimentally, it has been maintained that they unacceptably alter the nature of the sport."

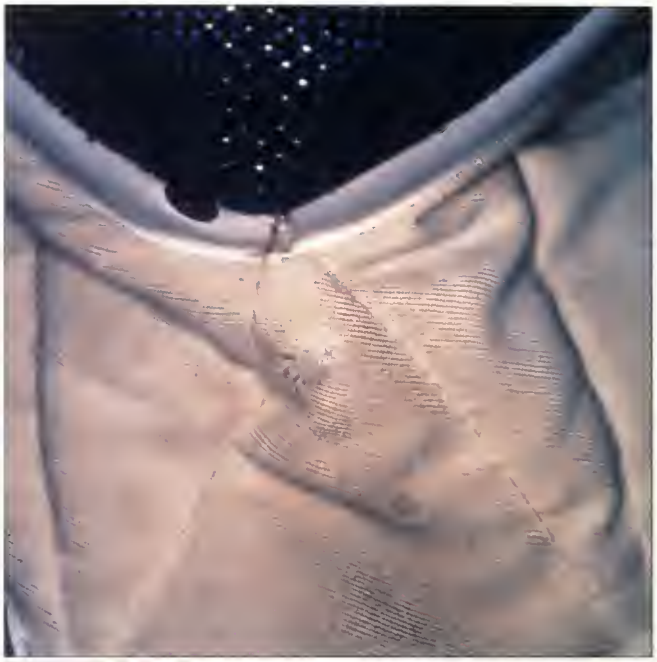
Fig 5: View of fencing mask/neckpiece shows frayed Kevlar edges and adjacent puncture defect.

Penetrating injuries to the neck are traditionally surgically explored if the wound penetrates the platysma layer.[3-7] Furthermore, penetrating injuries have traditionally been subdivided into zone 1 (low), zone 2 (medium), and zone 3 (high) injuries depending on the penetrating entrance wound. Zone 1 injuries occur below the lower border of the cricoid cartilage. Zone 2 injuries occur between the angle of the mandible and the lower border of the cricoid cartilage. Zone 3 injuries occur above the angle of the mandible. In general, Zone 1 and Zone 3 injuries tend to require angiographic evaluation more often than Zone 2 injuries, in which vascular injuries may be surgically addressed with relative ease because of the improved exposure in the zone.[8] Additionally, esophagoscopy, bronchoscopy, and laryngoscopy may be indicated, depending on the location of the penetrating injury.[3-9]

More recently, reports of selective management of penetrating neck injuries have arisen and reflect the trend toward observation of neck penetrating injuries that do not involve major neurovascular structures.[8,9] Otherwise, a significant subset of patients with no significant bleeding or neurologic deficits may be safely observed with antibiotic therapy.[8,9]

Our case is unusual in that physical examination (including fiber-optic nasopharyngoscopy) confirmed that path of the weapon to be strictly midline, with its deepest level of penetration being the cervical prevertebral region. The integrity of the bony cervical spine was confirmed by simple radiographic studies. No further angiographic or endoscopic studies were required. The patient was therefore spared an exploratory operation. Otolaryngologists/head and neck surgeons must be vigilant in assessing penetrating neck injuries with superficial wounds. ☐

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Why Nuclear Cardiologists and Stress Echocardiographers Need to Cooperate

Vincent L. Sorrell, MD, FACC

"The grass may or may not be greener on the other side of the fence, but to know for certain, one must stand upon the fence with an unobstructed view to clearly see both sides."*

An expert nuclear cardiologist, Dr. Ami Iskandrian, recently suggested that nuclear cardiology was superior to stress echocardiography in evaluating patients with chest pain and suspected coronary artery disease.[1] Similar articles in the echocardiography literature conclude that stress echocardiography is superior. I believe that both technologies are accurate and can provide clinically relevant information. Furthermore, I believe that stress echocardiographers would benefit from knowing the value of nuclear imaging and nuclear cardiologists from understanding stress echocardiography, and practicing doctors from knowing something about both. Here, I explain these "competing" techniques and request that cardiologists begin the new millennium with a greater respect for and collaboration with each other.

Stress echocardiography requires careful acquisition and display of images and highly experienced interpreters.[2] Digital images that display, side-by-side, left ventricular systolic motion during rest and stress is superior to videotape only. Without attention to technique, the quality of the data is diminished. Dr. Iskandrian relied, in part, on the study of Santoro, et al, to help derive his conclusions.[3] However, Santoro commented on the limited "availability [of] a quad screen digital display...," suggesting that a quad screen display was not used. This may impair the level of data quality acquisition, display, and interpretation. This is not meant to diminish the importance of their manuscript, but only to accentuate the necessity for understanding and using "local expertise."

Iskandrian said there were 3 major methodological reasons to reject stress echocardiography as a "first-line test":

1) Images are obtained immediately after exercise and therefore require "significant" ischemia to identify persistent, new wall motion abnormalities. It raises the question: How clinically relevant is "insignificant" ischemia? Despite this limitation, stress echo remains accurate.[2-4] One possible reason is that "stunning" of the myocardium induces a persistent wall motion abnormality. Studies that rely on perfusion imaging must be obtained at peak exercise, and radioisotopes are injected prior to exercise termination for this reason. Any delay in injection may miss this "window of stress-induced, lowered perfusion" and lower sensitivity. Both methods demand adherence to protocols and a high level of quality assurance—a recurring theme in all diagnostic imaging modalities!

2) Iskandrian states that the full extent of the ischemic burden may not be known since the development of ventricular wall motion abnormality during dobutamine testing is an indication to stop the test. I agree that if the test is being done to determine the presence or absence of myocardial ischemia, a new wall motion abnormality is an acceptable endpoint. However, if the patient is stable, there is no reason that the test cannot be continued to determine the extent of the ischemic burden. Rather than a weakness of echocardiography, one could consider this a weakness of nuclear scintigraphy. Since nuclear perfusion imaging is not done in real-time, the test cannot be stopped until the protocol is complete. These differences in protocol emphasize the importance of understanding the question being asked. Put another way, it confirms the importance of the relationship and communication of the referring physician and the interpreting physician.

3) Iskandrian rightly points out that there is no accepted *quantitative* analysis of echocardiography and that the subjective interpretation of wall thickening is difficult. Again, I emphasize that a high level of skill is needed, but that the same can be said about nuclear perfusion imaging. Subtle differences of perfusion depend on the expertise of the interpreter, are best analyzed with quantitative methods and emphasize the necessity for advanced training and continued experience.

I do not believe that it is sufficient to ask "*Which* test should be used ?" Both of these modalities are excellent tools in the

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proper hands. The question should be "*Which* test should be used on *this patient* with *this specific clinical situation* at *this institution* with *these interpreters*?" Each of these variables may determine the chosen "first-line test." If both testing modalities are provided with a high level of quality and experience at the same institution, then individual circumstances should dictate the testing choice. To do this, we must recognize the documented differences of these two modalities.

Most large studies have shown a slightly superior sensitivity with nuclear perfusion imaging and equal or greater specificity with stress echocardiography.[4] In other words, nuclear perfusion imaging may produce more false-positive interpretations and stress echocardiography, more false negatives. This single consideration may favor one test over the other in a patient. For example, airline pilots and school bus drivers might be better served with a perfusion test, since a false negative may have significant consequences for many, not just the individual. An athlete, or other low-risk individual, undergoing routine screening might be better served with stress echocardiography.

Stress echocardiography is done in real-time, so the results are available directly after stress. Time constraints may demand the use of stress echocardiography. Same-day preoperative evaluations can be completed with enough time remaining for the operation. Many institutions provide "fast-track" evaluation for same-day stress testing and operative interventions.

Other precautions may also guide test selection. Technically limited nuclear images are not uncommon. Also, even in experienced hands, peri-infarct ischemia and analysis of new wall motion abnormalities in patients with significantly abnormal resting images are extremely difficult. On the other side, patients with a left bundle branch block often have abnormal motion of the ventricular septum, but normal thickening. Stress echo can be used, but with caution. Perfusion imaging has variable accuracy, even with vasodilators, and again requires an understanding of the potential for false-positive findings.

Communication is key. House staff and faculty at our institution often call us before ordering a stress test to discuss individual variations, circumstances, and questions being asked. This helps us choose the optimal study for a given patient. We are fortunate to have credentialed, certified nuclear cardiologists who are additionally trained in stress echocardiography. This eliminates nonclinical driving forces.

It is worth emphasizing that no genuine optimal test can be determined since this requires a "gold standard." Equ coronary artery disease (a nonphysiological, anatomical entity) with ischemia is fragile at best. As a result, accurate calculations of echocardiographic and nuclear imaging modalities is based on a "less-than-golden" standard. It has been shown that a 50% narrowing of the coronary artery lumen will more often show a perfusion defect than a wall motion abnormality.[5] How this relates to clinically significant ischemia requires further study. In addition, comparing a testing modality that analyzes perfusion against one that interrogates wall motion further clouds the issue. It would be unlikely that a "perfect" perfusion study would absolutely correlate with a "perfect" wall motion study.

Both the American College of Cardiology and the American Heart Association state that coronary angiography should be reserved for patients most likely to benefit from revascularization procedures. I believe that both noninvasive testing modalities can stratify patients into subgroups at high and low risk for subsequent cardiac events. Presently, nuclear perfusion scintigraphy has the advantage of tradition; it has been in clinical and investigational use for nearly 30 years. However, outcomes data from the newer technique of stress echocardiography have been and are being generated.[6] Nuclear testing continues to improve its overall accuracy through quantitative analysis, use of gating methods, and attenuation and depth resolution compensation. Stress echocardiography is improving its accuracy and risk-stratifying capabilities through transducer technologies that provide endocardial image enhancement, methods for quantitative analysis, and other computer-generated techniques.

Both methods are here to stay. It is our Hippocratic duty to learn as much as we can to provide better risk assessment for each patient. I would rather tell a patient with a degree of certainty that they are—or are not—likely to have a cardiac event in the next few years, than to correctly predict the presence of angiographically visualized coronary artery stenosis.

I conclude with Iskandrian: "In the managed care era where cost-containment issues are paramount, the '*first-line test*' should provide all the necessary information for the decision-making process." We should all work to identify the optimal individual circumstances that endorse one modality over the other. I believe both modalities should be thought of as complementary to the goals of the cardiologist and his or her patient, rather than competitors of each other. ❑

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PCP? Gatekeeper? Provider?

Where's My *Doctor*?

James E. Hill, Jr., PA-C, MEd

I see my internist once a year for a physical examination even though I am basically an active, healthy person. I run 5 miles, 3 days a week and lift weights at the YMCA twice a week in addition to occasional scuba diving, canyon hiking in the Southwest, and "adventures" once or twice a year (fighter pilot flying, skydiving, bungee jumping, whitewater rafting, shark diving), but I recognize that travel and physical challenges become harder as I grow older. At 49, I'm blessed to be healthy except for a high blood cholesterol, well controlled by medication. Still, I believe that having someone look after my health is as important as my doing my part by living healthy.

My internist is a physician with University Medical Associates in Charlotte. He was a resident at Carolinas Medical Center when I worked as a physician assistant in the emergency department there. I thought he was one of the best resident physicians I had seen come through the program in internal medicine and, since we had become friends while he was there, I chose him as my doctor when he went into private practice. Fortunately, he is an "Aetna POS (point-of-service) provider," and can be designated as my "PCP" (primary care physician) to serve as the "gatekeeper" for all my health care. These are important points because I belong to a POS health care plan and I must select the physicians on that network list.

Last October I came for my annual physical exam, taking for granted the ease of communication, the degree of trust and the sharing of thoughts that our collaborative physician-patient relationship has built up over the years. Then a light with a high-watt bulb went on. I'd come to depend on that relationship with my physician—the kind of relationship doctor and patient must have in order to maximize the benefits of a medical relationship. I suspect that my own professional training and experiences have made me more aware of the value and importance of a stable, communicative, doctor-patient association. I really don't think there is anything more crucial to the success of any health care system.

Which brings me to my point: I think that managed care has changed the doctor-patient relationship more than any other factor I know of. Managed care came to have such impact because health care costs were skyrocketing and could not continue. It was thought at first (and some people still think) that high physician fees, inappropriate (read "expensive") testing, and unnecessarily long hospitalizations were to blame. Some corrections were required in those areas, but managed care essentially assumed responsibility for controlling *all* costs (the only way to be really effective thought many people). The role of factors like the high costs of new and remarkable technology were dismissed even though they are as responsible (maybe more so) as the health care cost targets chosen by HMOs. As with many big problems, drastic "solutions" produced drastic effects. In this case, patients and physicians felt the effects the most.

There was a confidence that the time-honored traditional care of patients by physicians would remain unchanged; that although some tests, hospitalizations, and salaries would be curtailed, patients would still have the ability to choose their doctor and that doctors would be able to decide which tests, medicines, and hospitalizations were necessary for each patient. As so often happens, the pendulum has swung too far and many are now suspicious of and disenchanted with managed care. Many people have experienced the unpleasant task of giving up their doctor because he or she is not on the health plan's list of "providers." They may end up with someone they've never seen before—and may not see again because of how rapidly health plan and provider lists change.

I want to make clear that my experiences as a physician assistant, both in and out of managed care clinical involvement, and as a manager within an integrated health care company working with managed care plans, have given me some interesting perspectives on managed care. The area that has touched me the most is the one involving "provider" networks created by the HMOs. These limited networks are based on physicians or groups of physicians who sign on after reviewing the "risk-benefit" ratio calculated for each HMO; they generally do not provide patients with full choices for physician selection.

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As a PA treating patients, I use the term "provider" since there does not appear to be a universally accepted term to encompass all professions involved in patient care (physicians, PAs, nurse practitioners, nurse midwives, and others). Physicians will tell you that they didn't go to medical school to become "providers"; they went to become doctors. Indeed, so they are. But our health care system has changed during the past 30 years to include PAs and NPs who carry out health care tasks traditionally performed and provided by physicians. So we use the term "provider" in a broad way to include anyone who provides medical care to patients. Perhaps not the best term (does one exist?) to describe those of us who provide patient care today, but I mean nothing derogatory. All of us struggle to maintain our identities in a health care system that increasingly strips us of those identities in the interest of "managed care." I still introduce myself to new patients as a physician assistant, not their "provider for the day." Health care business is still business and we all get grouped via some term for simplicity's sake.

I have been a PA since graduating from Duke University in 1976. I remember the most important lesson I learned while in training. Dr. Eugene Stead is the "father" of the physician assistant profession and also one of medicine's most respected clinicians. We heard many stories about Dr. Stead's methods of teaching his resident physicians. The lesson I took away from those stories and my training was that the best clinicians listen to their patients, observe them in every possible encounter from their arrival to their departure, and they base a diagnosis on the clues observed. Some problems, like otitis media, are diagnosed with a few questions and an otoscope, but others are not so easily diagnosed. The clinical skills developed by academic training must be augmented by the total history obtainable. The very best clinicians get to know as much as possible about the patient's family, living conditions, educational level, personal beliefs, and other potentially useful information.

A few years ago, Tennessee decided to provide health care to their Medicaid and uninsured population through a capitated payment scheme called TennCare. The care was coordinated through state-approved HMOs working under very strict guidelines and with the lowest reimbursement standards ever seen in this country. The capitated payments were passed down from the federal government to the state, to the HMOs, to the providers. Very little money was available for actual care. I represented my company in Tennessee during the development and start-up of TennCare, working with the Medicaid office, the legislature, and the managed care plans. Over the course of a year and a half, I saw the initial admirable attempt at providing universal health care coverage fall prey to the realities of limited dollars and limited provider networks.

Physicians were hesitant to accept the very low monthly payments per member offered for providing total care to TennCare patients. As a result, the HMO provider networks were sparse and the patients suffered. Many children with chronic disease no longer had specialists available to treat them; those living in rural areas were forced to travel an hour or more for routine medical care. The newspapers were full of stories of chronic illnesses out of control, sometimes requiring hospitalizations because past care or medications were no longer available. A number of deaths were reported in patients no longer able to receive the attention that appropriate primary and specialty care can prevent.

The cause of these horrible incidents was a system straining to provide health care to too many people for too few dollars. They make a telling statement about the value of having a doctor. A doctor who knows his or her patients, their lifestyles, their families, and their problems can make all the difference in the world to someone struggling with illness and disease. It is the doctor who makes the difference, not the HMO, not an insurance company, not a "capitated gatekeeper."

If HMOs are to succeed, they must recognize and nurture the doctor-patient relationship as absolutely crucial to short- and long-term care benefits. The best way to develop that relationship is for HMOs to have open networks, which encourage the same patient to be able to stay with a provider they've come to trust and know, just as the physician and PA and NP come to know that patient and his or her life. That arrangement makes for better assessments, it makes for better relationships, it makes for better health care. ❑

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In response to a 1944 polio epidemic, a camp in Hickory was converted to an emergency polio hospital, which became known as the "Miracle of Hickory" (courtesy March of Dimes, © North Carolina Museum of History).

Health and Healing Experiences in North Carolina

A Special Exhibition at the North Carolina Museum of History

From a Cherokee sweat lodge to alternative therapies and a modern-day hospital room, visitors to the Museum's exhibit will hear, see, and read the personal stories of North Carolinians as they struggle with health care issues in their lives.

Occupying 9000 square feet of gallery space, the exhibit is the largest mounted by the Museum, which is located in downtown Raleigh across from the State Capitol. Operating hours are Tuesday-Sunday 9 am-5 pm and Sunday 12-5 pm, 919/715-0200. Free admission. Internet: http://nchistory.dcr.state.nc.us/museums

Instructions for Authors

The *North Carolina Medical Journal* is a medium for communication with and by members of the medical community of this state. The *Journal* publishes six times a year: in January, March, May, July, September, and November.

The *Journal* will consider for publication articles relating to and illuminating medical science, practice, and history; editorials and opinion pieces; letters; personal accounts; poetry and whimsical musings; and photographs and drawings. Papers that relate to the present, past, or future practice of the health professions in North Carolina are especially pertinent, but manuscripts reflecting other perspectives or topics are welcomed. Prospective authors should feel free to discuss potential articles with the editors.

Manuscript Preparation

Prepare papers according to the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (N Engl J Med 1991;324:424-8) with the following exceptions: 1) no abstract is needed; 2) no running title is needed; and 3) report measurements in metric units; use of the International System of Units (SI) is optional.

Submit a cover letter and a 3 1/2-inch computer disk that contains the text written in MS DOS- or Macintosh-compatible format. *Also enclose three hard copies of the text for review purposes.* Double space text with one-inch margins. *Please do not "format" the text* (e.g. no variations in type size, no bold face, no italics, no embedded endnotes).

Submit photographic illustrations, in duplicate, as high-quality color 35mm slides or 5-by-7 or 8-by-10-inch glossy prints, or as black-and-white glossy prints (5-by-7 or 8-by-10-inch). Label all illustrations with author's name, number them sequentially according to their position in the text, and indicate the orientation of the images, if necessary. *Do not write directly on the backs of prints.* This can damage them. If figures require printing in four-color process, we may ask the author to pay printing fees or a portion thereof.

Submit tables, charts, and graphs as hard copy *and* include copies on disk, in their original format *and translated as TIFF, PICT, or EPS documents.* Type all figure legends separately. Type and double-space all tables, one to a single sheet of paper. Tables must have titles and consecutive Arabic numbers.

Keep references to a minimum (preferably no more than 15), retaining those that document important points. The "Uniform Requirements" cited above contain reference format. We customarily list the first three authors for "et al"-type references. Authors are responsible for the accuracy and pertinence of all citations.

Avoid abbreviations entirely if possible; keep them to a minimum if not. When used, completely define abbreviations at the first point of usage in the text.

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A medically qualified editor reads all manuscripts and, in most instances, sends them out for further review by one or more other members of the North Carolina Medical Society. *Authors' cover letters must include a line that states that their submitted manuscripts are not under consideration for publication elsewhere. It is not the Journal's policy to reprint previously published articles.* Decisions to publish or not are made by the editors, advised by the peer reviewers.

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Aphorisms of the Month

Daniel Sexton, MD, Section Editor

"Twelve One-Liners About Success"

Greatness is a two-faced coin—and its reverse is humility. —*Anonymous*

If you want your place in the sun, you must expect to get blistered. —*Anonymous*

One way to get to the top is to get to the bottom of everything. —*Anonymous*

The difference between a wise guy and a wise man is plenty. —*Anonymous*

Success is a poison that should only be taken late in life, and then only in small doses. —*Anthony Trollope*

An upper-class neighborhood is one in which you can sit in the yard in shorts but not in your undershirt. —*Anonymous*

Money never makes a fool of a man, but it may expose the fool in him. —*Anonymous*

Only a few men owe their success to golf. Most of them owe their golf to their success. —*Anonymous*

The person who has the approval of his own conscience has a powerful ally. —*Anonymous*

When you see a turtle on the top of a fence post, you know he didn't get there by himself.—*Robert J. Lamont*

Section editor is Dr. Dan Sexton, Box 3605, DUMC, Durham, NC 27710. e-mail: sexto002@mc.duke.edu

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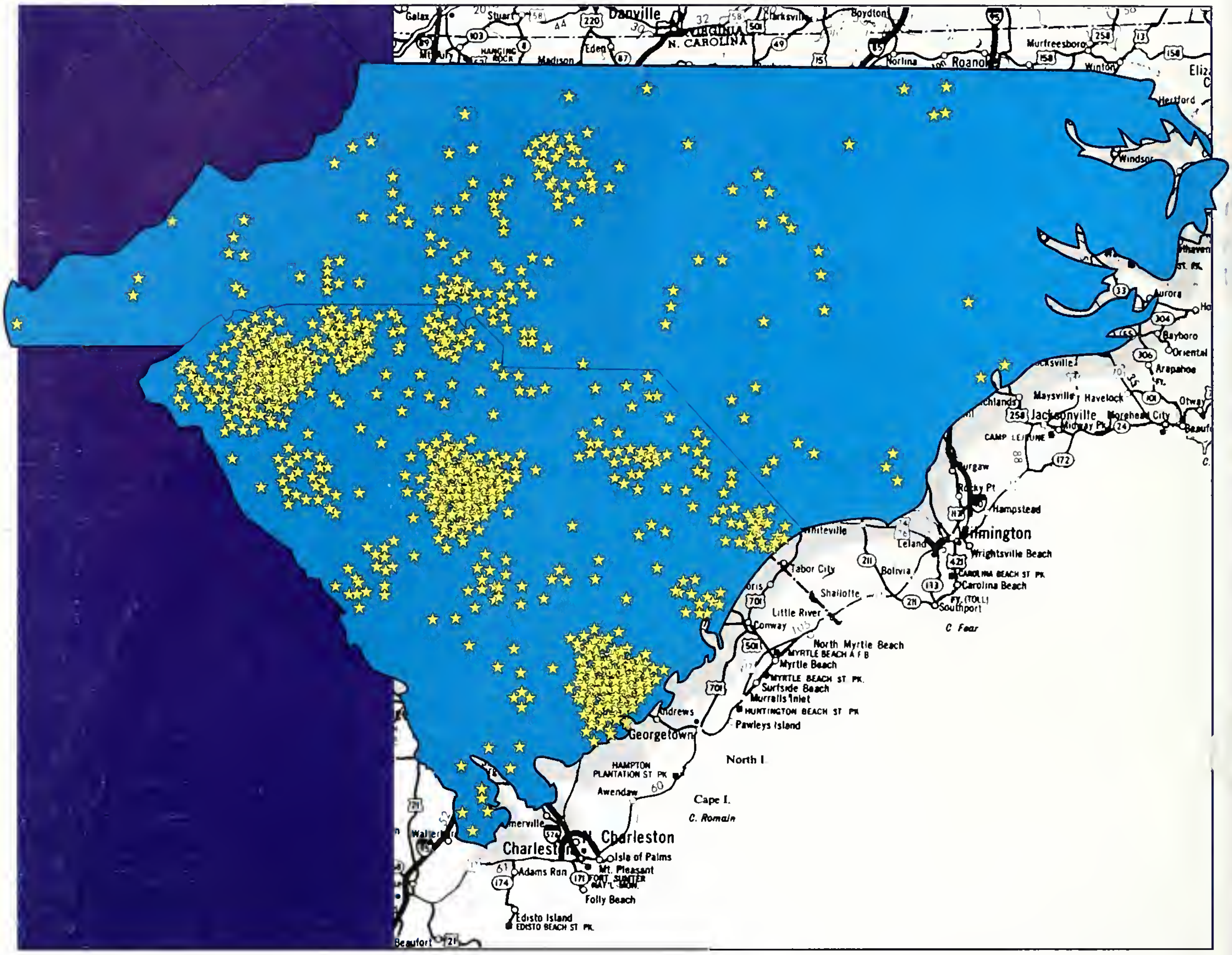

What can a map tell you about a computer system?

Plenty — if, like this one, it shows how many medical offices in the Carolinas use a particular practice management system to run more efficiently, effectively, and profitably.

For example, it might show how a 16-year commitment to "Working for Physicians" has resulted in over 800 installations in North and South Carolina.

It might bring home how features like "on-the-fly" refiling, encounter-form tracking, and direct transmission to North Carolina Medicare, Medicaid, and Blue Cross/Blue Shield (with no per-claim charges) are improving physicians' revenue.

It could clarify how critical "one-call" support can be in helping offices stay productive — how telephone support staff, software and hardware engineers, technicians, trainers, and a fleet of service vans can provide support unmatched in the industry.

It might demonstrate how on-going research and development brought innovations like the first integrated, direct electronic claims transmission in a practice management system.

Or it could validate the concept of regional focus: By selling systems only in the Southeast, a computer company can keep customers up-to-date on the latest insurance filing requirements.

It could emphasize the flexibility of multi-user, multi-tasking software that runs on the most popular operating system in the world.

And it could illustrate the value of having a computer vendor with a vision for the future and the expertise to make that vision work for you.

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